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The Delayed Entry Program's effects on initial entry training attrition

Lukasiewicz, Chris E.

Monterey, California. Naval Postgraduate School

NAVAL POSTGRADUATE SCHOOL
Monterey, California

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THE DELAYED ENTRY PROGRAM'S
EFFECTS ON
INITIAL ENTRY TRAINING ATTRITION

by

Chris E. Lukasiewicz

March 1995

Thesis Advisor: Lyn R. Whitaker

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The Directorate of Personnel Management at the office of the Deputy Chief of Staff for Personnel (DCSPER) establishes the Army's future personnel needs and sets the Department of the Army (DA) accession mission for the United States Army Recruiting command (USAREC). Recently, DCSPER accession planners have had difficulty in assigning the appropriate accession mission due to the large number of losses during the first term. The first term begins when a soldier enters his basic military training and continues until his initial contract period is completed. Attempts to explain these attrition rates have focused around USAREC's Delayed Entry Program (DEP) management. The DEP serves a variety of roles for USAREC and is used as an inventory system of recruits which acts to smooth out the seasonal fluctuations in demand for IET soldiers.

This study investigates the relationship between the time an individual spends in the DEP and the risk of becoming a loss during the initial entry training (IET). Furthermore, it explores other factors related to IET attrition.

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THE DELAYED ENTRY PROGRAM'S EFFECTS ON INITIAL ENTRY TRAINING ATTRITION

Chris E. Lukasiewicz
Captain, United States Army
B.S., Colorado State University, 1984

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March 1995

Author: [redacted]
Chris E. Lukasiewicz

Approved by: [redacted]
Lyn R. Whitaker, Thesis Advisor

[redacted]
So Young Sohn, Second Reader

[redacted]
Peter Purdue, Chairman
Department of Operations Research

ABSTRACT

The Directorate of Personnel Management at the Office of the Deputy Chief of Staff for Personnel (DCSPER) establishes the Army's future personnel needs and sets the Department of the Army (DA) accession mission for the United States Army Recruiting command (USAREC). Recently, DCSPER accession planners have had difficulty in assigning the appropriate accession mission due to the large number of losses during the first term. The first term begins when a solider enters his basic military training and continues until his initial contract period is completed. Attempts to explain these attrition rates have focussed around USAREC's Delayed Entry Program (DEP) management. The DEP serves a variety of roles for USAREC and is used as an inventory system of recruits which acts to smooth out the seasonal fluctuations in demand for soldiers.

This study investigates the relationship between the time an individual spends in the DEP and the risk of becoming a loss during the Initial Entry (IET) period. The IET consists of basic and advanced individual training and accounts for the first four to six months of Army life. Furthermore, it explores which enlistment factors are the most significant in explaining IET attrition.

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EXECUTIVE SUMMARY

A. BACKGROUND

The mission of the United States Army Recruiting Command (USAREC) is to recruit soldiers for today's Army. The use of the Delayed Entry Program (DEP) in processing enlistments for the Army has been an increasingly popular recruiting mechanism. The DEP allows potential recruits to contract for enlistment in specific occupational training as much as 12 months in advance of their actual shipping or accession dates. DEP pools are critical because they act as an inventory from which both the Directorate of personnel management for the Deputy Chief of Staff of Personnel (DCSPER) and USAREC plan future accession missions.

Recently, DCSPER accession planners have had difficulty in assigning the appropriate accession mission due to the large number of losses during the first term. The first term begins when a soldier enters his basic military training and continues until his initial contract period is completed. Attempts to explain these first term attrition rates have focused around USAREC's Delayed Entry Program (DEP) management.

B. PROBLEM STATEMENT

A concern of the U.S. Army is the attrition rate for Initial Entry Training (IET) soldiers. IET consists of basic

and advanced individual training and normally last between four to about six months and thus may be shorter than the first term.

C. APPROACH

The objective of this thesis is to study the relationship between the time an individual spends in the DEP and the risk of becoming an IET loss and which factors are most important in exploring IET attrition. The approach taken in this thesis is to begin with a detailed exploratory analysis followed by a more formal statistical analysis. The formal analysis involves attempting to fit a logistic regression model where the binary response variable indicates whether the individual was an IET loss or not and the exploratory variables include age of enlistee, AFQT score, enlistment bonus, combat arms MOS, gender, education level, race, and time in the DEP.

D. CONCLUSIONS

The dramatic increase in first-term attrition observed over the past few years was not seen for IET attritions. In fact, IET attritions have decreased slightly over the past two years. The time a potential recruit spends in the Delayed Entry Program is not as important to IET attrition as expected. Although, in general, most groups that have higher attrition rates tend to spend less time in the DEP. For almost every category of recruit, IET attrition rates are lowest for cohorts spending between six to eight months in the DEP.

Recruits who accept enlistment bonuses are more likely to attrite than those who do not accept bonuses. Whites have higher attrition rates than any of the other races, although for blacks, attrition rates have been increasing over the past four years. Females have higher attrition rates than males but exhibit similar distributions for DEP time. Enlistees who score above 60 on their AFQT have a much greater chance of completing IET than someone who scored lower than 60.

Combat Arms MOS's have an overall lower average attrition rate and longer average DEP lengths although the trend for the last two years has been the opposite. Finally, there are many factors related to enlistment like AFQT score, gender and education level which explain more about predicting IET attrition than the time an individual spends in the Delayed Entry Program.

I. INTRODUCTION

A. PROBLEM STATEMENT

A concern of the U.S. Army is the attrition rate for Initial Entry Training (IET) soldiers. IET consists of basic and advanced individual training and normally last about six months. These soldiers are leaving during their first term of service at an alarming rate. The first term begins when a soldier enters his basic military training and continues until his initial contract period is completed. The first term can be shorter than IET. This is one of the issues which face the Directorate of Personnel Management at the office of the Deputy chief of Staff for Personnel (DCSPER). This directorate establishes the Army's future personnel needs and sets the Department of the Army (DA) accession mission for the United States Recruiting Command (USAREC).

Although DCSPER's personnel management section assigns the accession requirements for USAREC, the two organizations focus on two aspects of meeting the needs of the Army. USAREC's recruiting approach is designed to meet monthly quotas providing recruits with specific qualifications at specific time periods. However, it is <u>not</u> responsible for a contract after the accession date. On the other hand, DCSPER's concern is with filling the authorized troop levels, and it focuses on soldiers who have entered the Army after their accession date.

Due to the ongoing downsizing of the Army and the ever increasing budget cuts, USAREC has been experiencing a "tough" recruiting market. The tough market has made it even more difficult for recruiters and USAREC to meet their accession requirements. Recruiters may sometimes rush into signing a contract before the individual has had a chance to be trained in the DEP just to satisfy the monthly accession requirements {Ref.1}. This lowers the chance a contract might be lost in the DEP, more commonly called a "DEP loss". The result of this recruiting method is a decrease in the average time a recruit spends in the DEP.

The average time spent in the DEP decreased considerably from FY 1992 to FY 1993 {Ref.2}. At the same time, the first-term loss rate increased dramatically {Ref.2}. The DEP pattern seen in FY 1993 allows USAREC to more easily meet their quotas, but causes some major problems for the DCSPER. One of the more important of these problems comes when planners are forecasting troop strengths and filling basic training seats.

This thesis will investigate if the time a contract spends in the DEP has a significant effect on IET attrition. Additionally, this thesis will investigate the effects of

other factors such as gender, educational status, age, race, enlistment bonus, AFQT score, and chosen MOS[1] on IET attrition.

B. BACKGROUND

The mission of the USAREC is to recruit soldiers for today's Army. The use of the DEP in processing enlistments for the Army has been an increasingly popular recruiting mechanism. The DEP allows potential recruits to contract for enlistment in specific occupational training as much as 12 months in advance of their actual shipping or accession dates. DEP pools are critical because they act as an inventory from which both DCSPER and USAREC plan future accession missions.

The DEP has many positive effects for the Army's personnel planners and for recruiters. It enables the Army to complete required background investigations on recruits. It allows planners to maintain a level training load at basic training locations. It gives recruiters the opportunity to train their prospects at least once a month, ensuring that DEPers maintain their physical and mental qualifications for enlistment, and that they sustain their desire to enlist. Finally, DEP offers potential recruits the opportunity to consider their choice and to prepare for the change to military life. Previous studies demonstrate that a large DEP

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[1]Military Operational Skill (MOS) is the occupational job skill which each individual chooses upon enlisting in the Army.

pool of contracts may indeed promote recruiting {Ref.3}. This is due to promotion incentives extended to DEPers for contributing referrals.

There are also disadvantages to using the DEP. For instance, USAREC PAE analysts claim that the longer a recruit remains in DEP, the higher the possibility that he or she will become a loss {Ref.1}, a term used to describe a recruit who reneges on his or her contract. In fact, USAREC estimates that about 15% of all recruits become DEP losses {Ref.1}. USAREC has put a considerable amount of effort into reducing the cost of DEP losses, and have commissioned many studies {Ref.4-6} to analyze the factors which affect DEP losses. Most recently, Vales {Ref.7} estimated the probability that an individual would access given the time he had survived in the DEP. Another study by Burris {Ref.8} looked at DEP loss as a function of the number of recruits contracted to be in the DEP, and developed an optimization model to assist USAREC analysts in setting their monthly recruiting goals. Considering the recruiting cost of roughly $5000 per recruit, and the increasing demand for budget reductions, it seems logical to try and minimize DEP losses by decreasing the time a recruit spends in the DEP.

Although DEP losses are a major concern for USAREC, losses after a person enters the Army are more costly and directly contribute to future personnel shortages. First Term attrition rates during the last six months of FY93 reached an

all time high, prompting inquiries from the DCSPER directed at identifying the attrition causes. The first term begins when a soldier enters his basic military training and continues until his initial contract period is completed. These inquiries identified that the decrease in average time spent in the DEP by incoming recruits might have a causal relationship with the high attrition rates. In an attempt to identify factors related to attrition, DA has sponsored many research efforts. One of the more prominent studies {Ref.9} presented a theoretical discussion of enlistment and first-term attrition decisions. It examined both enlistment and six-month attrition decisions as well as enlistment and 35-month attrition decisions in an attempt to discover whether variables governing an individual's willingness to enlist also affect his likelihood of attrition. The results of the study showed that some enlistment variables are determinants of attrition. Foremost were high school senior versus high school graduate status and positive versus negative education expectations. The study went on to say that another key indicator of attrition was the months spent in the DEP because this indicated that an enlistee was a good planner and was less likely to be disappointed with life in the military. Additionally, longer DEP queues are associated with more valuable military occupations and tend to offer more valuable training in the civilian sector, which act collectively to reduce attrition.

Recently, Matos {Ref.10} investigated the relationship between the time an individual spends in the Navy's DEP and the risk of becoming a DEP loss. Matos also looked at the time an individual spends in DEP and the risk of becoming a boot camp (the Navy's equivalent to the Army basic training) loss, or an in-service (the first two years of Navy life) loss. His research determined that the time an individual spends in the DEP has a larger effect on attrition during the DEP than it does on attrition after the contract accesses, which is expected. This research effort is similar to the studies mentioned above in that it tries to identify which variables of an enlistment contract affect Army attrition rates. It differs from any of the previously mentioned studies in that we concentrate on attrition in the IET period and attempt to determine an optimal time an individual should participate in DEP to maximize his chances of continuing his military service career. Additionally, it investigates the effects of variables, such as enlistment bonus, which have not been examined previously.

C. SCOPE

This thesis focuses on active duty personnel who have failed to meet the minimum requirements during IET. Since losses during the IET phase cost considerably more to manage than the DEP, it is critical that the DEP be managed efficiently, and that the personnel entering IET have a higher propensity for fulfilling their contracts.

There are many factors which determine how DCSPER's personnel management section assigns the accession requirements for USAREC. Recently attention has been focused on the increasing percentage of first-term attrition. The first-term starts when an individual is shipped to basic training, and continues until contract completion. The first term begins when a soldier enters his basic military training and continues until his initial contract period is completed. This study will focus on attrition during the period referred to as Initial Entry Training (IET), which may be shorter than the first term.

The DCSPER manpower section uses a detailed computer based system to track market trends and predict the accession mission for the Army. This system, called the Cohort Targeting System, statistically explored factors which may be affecting early attrition. The one factor, identified most clearly by the system, is that average DEP lengths have decreased significantly between FY 1992 and FY 1993.

Since many of USAREC and DCSPER's concerns revolve around budget, it is interesting to compare the cost of the IET loss with that of a DEP loss. Because an IET loss occurs later in the military career cycle, greater costs are associated with an IET. The cost of losing a soldier during IET ranges from $7500 to over $10,000 per soldier, whereas a new recruit lost

in the DEP is approximately $5000. Clearly it seems that eliminating a possible IET loss candidate prior to the accession date would save the Army a great deal of money.

D. THESIS ORGANIZATION

Chapter II given an overview of the data sets used for the research. Chapter III describes the preliminary analysis used to determine the relevant variables for model fitting. Chapter IV covers the methodology and final analysis used to create the Logistic Regression Model and gives the results. Chapter V presents the conclusions and recommendations from the study.

II. DATA DESCRIPTION

Comparing the attrition data with the DEP involves two large and separate data sets. The DEP data originates from the USAREC Mini-master files and encompasses accession statistics from 1987 to 1993. The attrition data originates from the Army Training Requirements and Resource System (ATRRS) which tracks IET soldiers from Basic Training through AIT. The key element or variable which allows the two data sets to be cross referenced and eventually matched is the Social Security Number (SSN).

A. RECRUITING DATA

The Mini-master file is one of the primary sources from which the analysts at the Missioning Division of the Program Analysis and Evaluation (PAE) Directorate of USAREC compute trends in the recruiting market. These analysts are responsible for ensuring that USAREC fulfills the DA accession mission. They must use the available statistical tools to predict trends, and account for losses in the DEP. A USAREC PAE analyst will spend hours each day, manipulating these data files to set quarterly recruiting goals for the recruiters, and perform any other analysis which the headquarters so desires.

A total of 547,110 records were provided from USAREC for this study. Table I describes a subset of the variables for 1988 and later Mini-master database records and gives further explanation as to the meaning of each variable name. The variables listed in the left column of Table I were determined

Table I SPSS VARIABLES FOR MINIMASTER FILE

Variable Name	Variable Description
SSN	Social Security Number
ACCDATE	Accession Date, The date an enlistee leaves the DEP and enters BT
TIMEDEP2	Actual Time (Months) in the DEP
NBOX	Mission Box Designation, Gives education level, service history, gender, and AFQT score.
TMOS	The Military Operation Skill which the enlistee chose
AGE	Age in Years when enlistee signs contract
RACE	Race of enlistee, W=White/Caucasian, B=Black etc.
TERM	Term of Service in Years
ACF	Request Army College Fund Taker, did the enlistee chose to participate in the ACF? Y/N
SEX	Male or Female
BONUS	Request Bonus Taker, whether the individual signed for an enlistment bonus or not

to be the most relevant for this research based on conversations with USAREC analysts.

B. ATTRITION DATA

The Army Training Resource Requirements System can only be accessed from remote terminals by authorized Army personnel. This makes gathering the data difficult at best. Since the ATRRS is a relatively new system, the data starts with FY 1990 attrition records and contains attrition statistics up to the present. The ATRRS is somewhat limited in that once an individual graduates from IET, his active record is transferred to a different database system. As a result, obtaining attrition statistics beyond IET becomes an even more detailed issue. Table II gives some insight into the variety of information obtained by accessing the ATRRS.

Table II KEY VARIABLES FROM ATRRS

Variable Name	Description
SCHCODE	Code for the school enrolled in when the cohort attrited
CRSNO	Course Number for IET
DSCHCOD	Discharge Code (A thru L) (See Table IV)
FY	Fiscal Year of Separation
SSN	Social Security Number

The ATRRS provided over 28,000 attrition records starting in FY 1990 and including all of FY 1993.

The Mini-master data file includes records from 1988 through 1993, whereas the ATRRS data file only records files since 1990. This limited the scope of the study to four years, FY 1990 to FY 1993. Table III gives a complete summary of the total number of records used in the study. Of the 28,696 records from ATRRS, 28,174 records were matched with the Mini-master file.

Table III DATA SUMMARY

YR	TOTAL ACCESSIONS	TOTAL IET ATTRITION	UNMATCHED RECORDS	IET ATTRITION RECORDS USED
90	88,071	7,069	220	6849
91	77,121	7,515	128	7391
92	76,121	6,719	55	6664
93	74,603	7,389	119	7270
ALL	316,524	28,696	522	28174

The 522 unmatched records, less than two percent of the total, were not felt to be detrimental to the study.

III. DATA ANALYSIS

A. PRELIMINARY DATA ANALYSIS

A crucial step in the analysis process involves defining attrition rates for a particular fiscal year. In this thesis attrition rates for a fiscal year are computed as the percentage of attrition among the accessions for that fiscal year. Note that attrition can occur in the next fiscal year and that recruits who attrited in the fiscal year of interest but who accessed in the previous year are not included.

B. DESCRIPTIVE VARIABLES

DEP length, accession date, and attrition date are important in determining trends for IET losses and in understanding how to fit the model. These variables give insight into determining yearly, seasonal and monthly effects relating to attrition and recruiting. Figure 1 shows that during fiscal years 1990 to 1993 IET attrition reached an average of 8.7 percent of the total number of accessions. It is interesting to note that these percentages differ from the six month attrition rates reported by the DCSPER manpower section over this same period. The differences may be attributed to the length of

time, from accession to discharge, which the soldiers are being tracked.

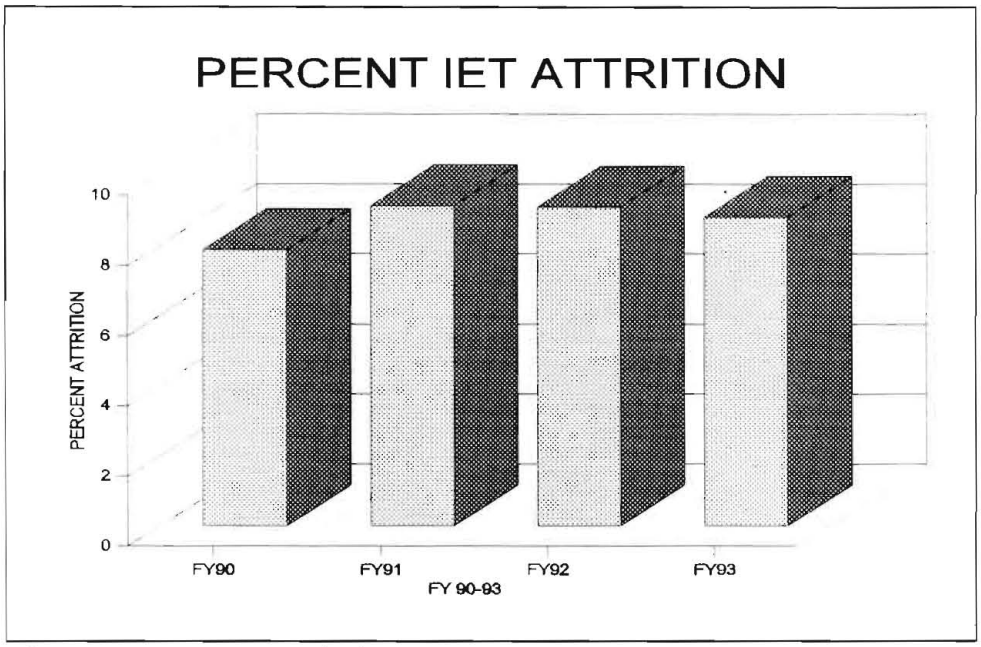


Figure 1 IET Attrition Rates for FY 90-93

This report concentrates on the IET period which lasts on average from four to six months depending on the MOS of the soldier. DCSPER's manpower section uses the Cohort Targeting System (CTS), which tracks each soldier up until a specified period of time, in this case six months. As a result, the CTS reports a larger number of attritions and shows higher attrition rates than this study. This was an important consideration in detecting trends of IET attrition and in determining if the data sets for the study were complete and logical.

The average time an individual spent in the DEP for all IET discharges by year is given in Figure 2. We see that the average DEP lengths had been decreasing steadily until FY 1992 when a large pool of high school seniors were accessed

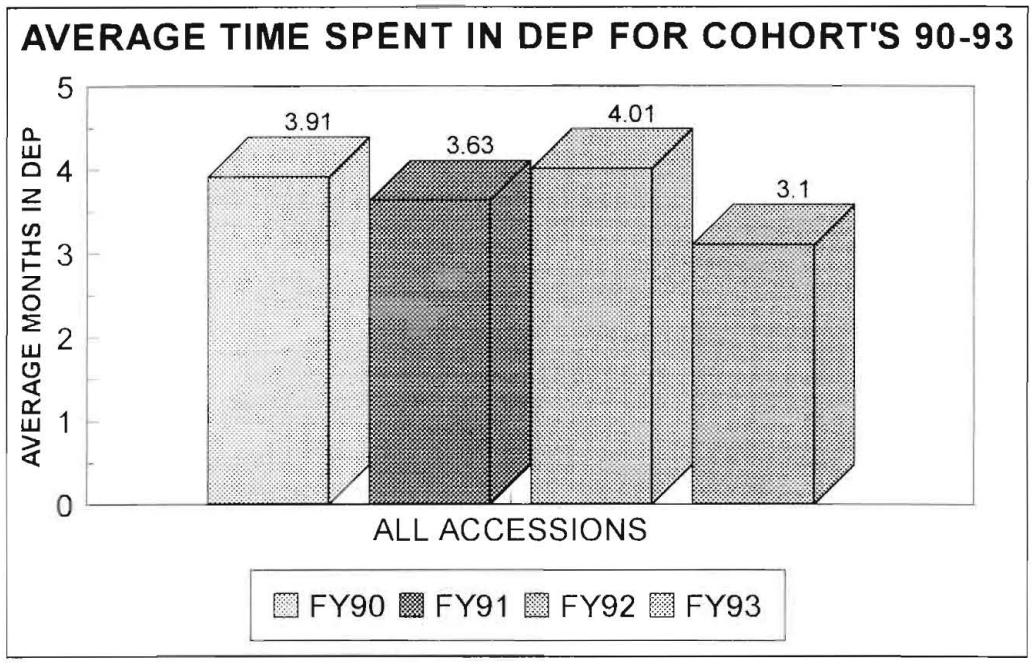


Figure 2 Average Time in DEP for Each Year

into the Army based on a policy change in DA which opened up the recruiting market to seniors [Ref.1]. This decreasing trend continued in FY 1993 reaching the lowest average DEP time of any year considered.

Figure 3 suggests that up to a certain time there is an inverse relationship between the amount of time a cohort spends in the DEP and the risk of becoming an IET attrition statistic. The proportionality differences are contrary to

what occurs in DEP loss, where it has been shown that as Time in DEP increases the chance of becoming a DEP loss also increases. This relationship was discussed during early

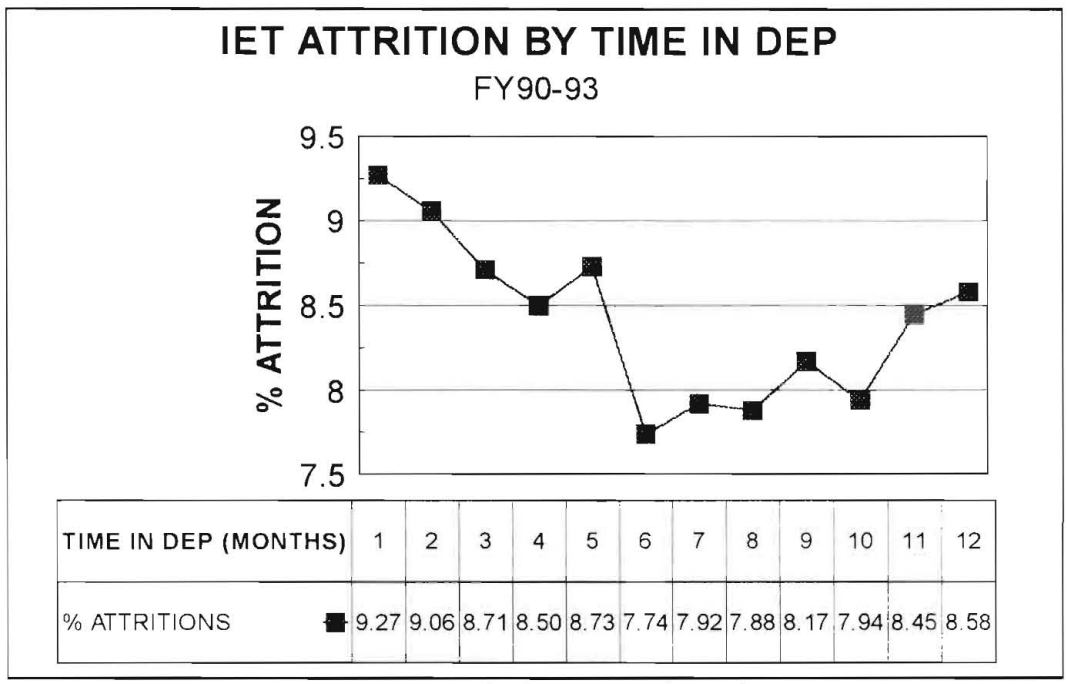


Figure 3 FY 90-93 IET Attrition by Time in DEP

research conducted by Buddin in 1981 [Ref.11] and again by Flyer and Elster in 1983 [Ref.12]. Figure 3 shows that there is a period of time in DEP, between 0-6 months, when IET attrition rates are mostly decreasing. The attrition rate reaches its lowest point when an individual spends at least 6 months in the DEP. From 7-12 months the attrition rates fluctuate but seem to be gradually increasing.

C. DEMOGRAPHIC VARIABLES

A set of demographic variables is included to add depth to the research effort and to further explain IET attrition and DEP relationships. Figure 4 verifies that gender has significant impact on the attrition rate during IET, and so must be modeled appropriately. The attrition rates for females are about 4 percent higher than for males.

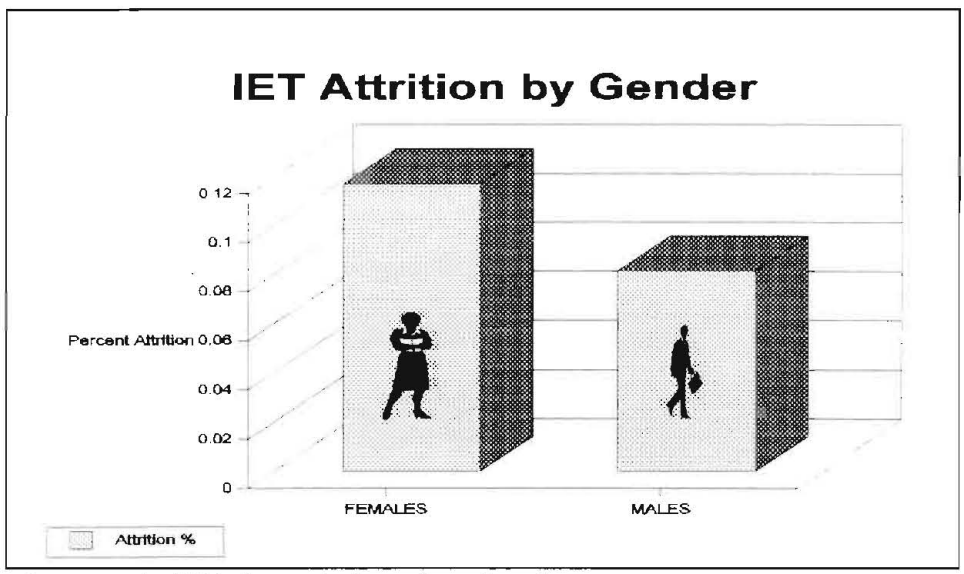
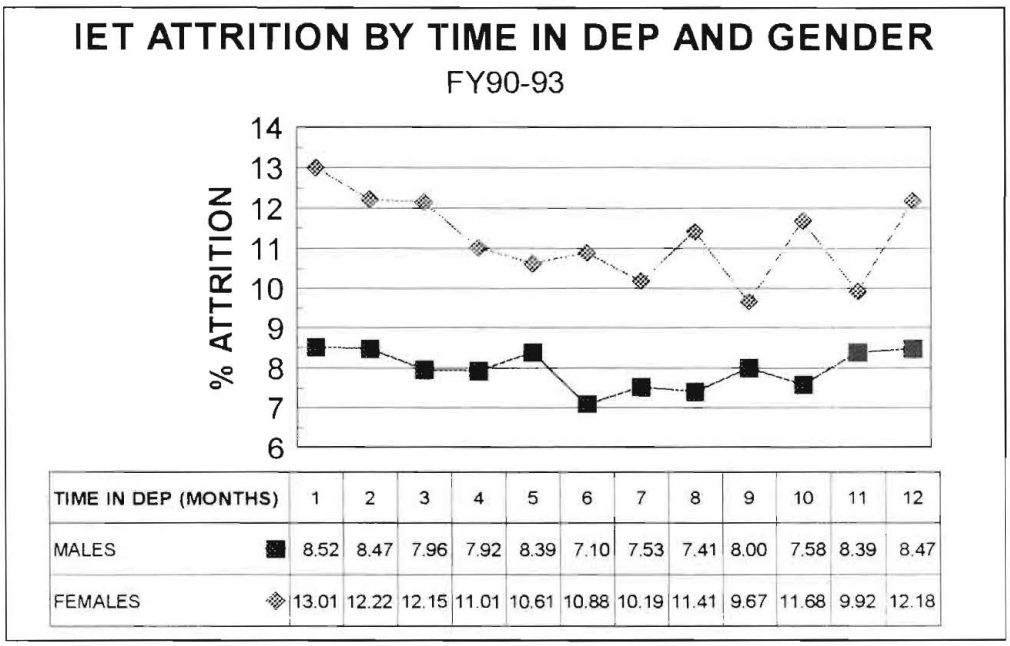


Figure 4 IET Attrition by Gender

It is interesting to notice that the trends seen in Figure 3 and 4 are followed by both genders, as shown in Figure 5. Here both sexes display similar decreasing attrition rates up to six or seven months in the DEP. After the seven-month point the attrition rates fluctuate but remain relatively steady until the tenth month where again we see a gradually increasing trend. Out of 48,535 females

accessed from FY90-93, only 2408 (less than 5 percent) experienced DEP lengths over eight months. This helps to explain the variability shown by the female recruits in DEP months 8-12 of the graph.



TIME IN DEP (MONTHS)	1	2	3	4	5	6	7	8	9	10	11	12
MALES	8.52	8.47	7.96	7.92	8.39	7.10	7.53	7.41	8.00	7.58	8.39	8.47
FEMALES	13.01	12.22	12.15	11.01	10.61	10.88	10.19	11.41	9.67	11.68	9.92	12.18

Figure 5 IET Attrition by Time in DEP and Gender

IET attrition for various education levels at the time of signing the enlistment contract is given in Figure 6. *HS SENIOR* stands for High School students who are in their senior year and will graduate in twelve or less months. *HS GRAD* are those contracts who hold a High School Diploma. *GED* contracts are individuals who have earned a high school diploma through an equivalency program. *PRIOR SERVICE* are personnel who have served time in any of the military

services, and the remaining contracts are non graduates, referred to as a *NON-GRAD*. It is important to note that the number of individuals accessed in each of these groups is

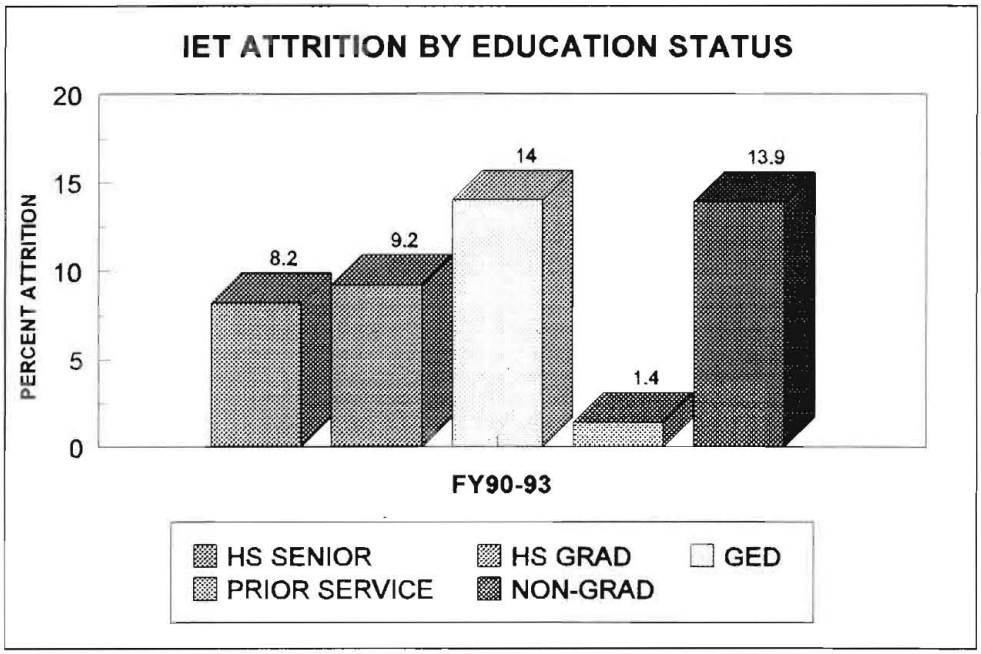


Figure 6 IET Attrition by Educational Status

vastly different. While it is true that *NON-GRAD* and *GED* categories have much higher IET attrition rates, Figure 7 shows that the number of accessions in these two categories do not have a great impact on the population. *HS SENIOR*, *HS GRAD* and *PRIOR SERVICE* categories make up about 97 percent of the total accession population. As such, the modeling effort will concentrate on the last three categories mentioned to explain IET attrition.

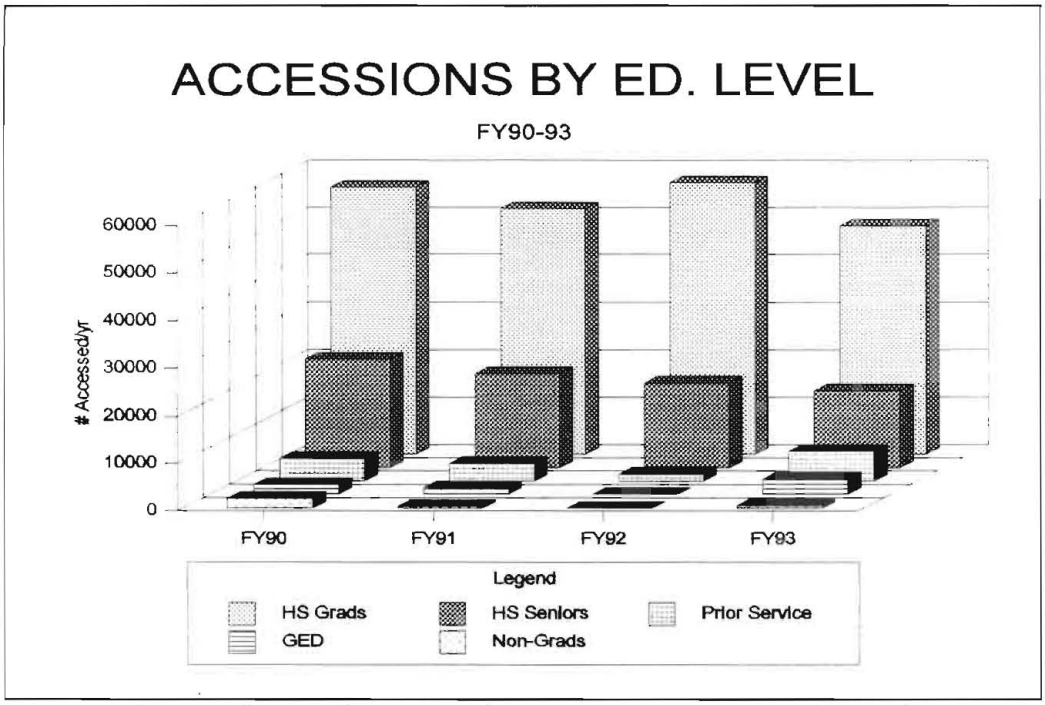


Figure 7 Number of Accessions Per Year by Education

The DA accession mission specifies the number of individuals who must access into or enter the Army as well as the proportion of recruits in various categories. Table IV summarizes the accession mission for 1994 [Ref. 8, Table I], and shows that less than 5 percent of the total accession mission is from *GED* and *NON-GRAD* categories. This is similar to the accession missions for each of the years from FY 1990 to FY 1993.

Another variable explored was race, Figure 8 shows that whites have higher attrition rates than any of the other races in the four years considered. This is not

surprising, since whites generally have more job opportunities outside the military, according to survey

Table IV 1994 DA ACCESSION MISSION

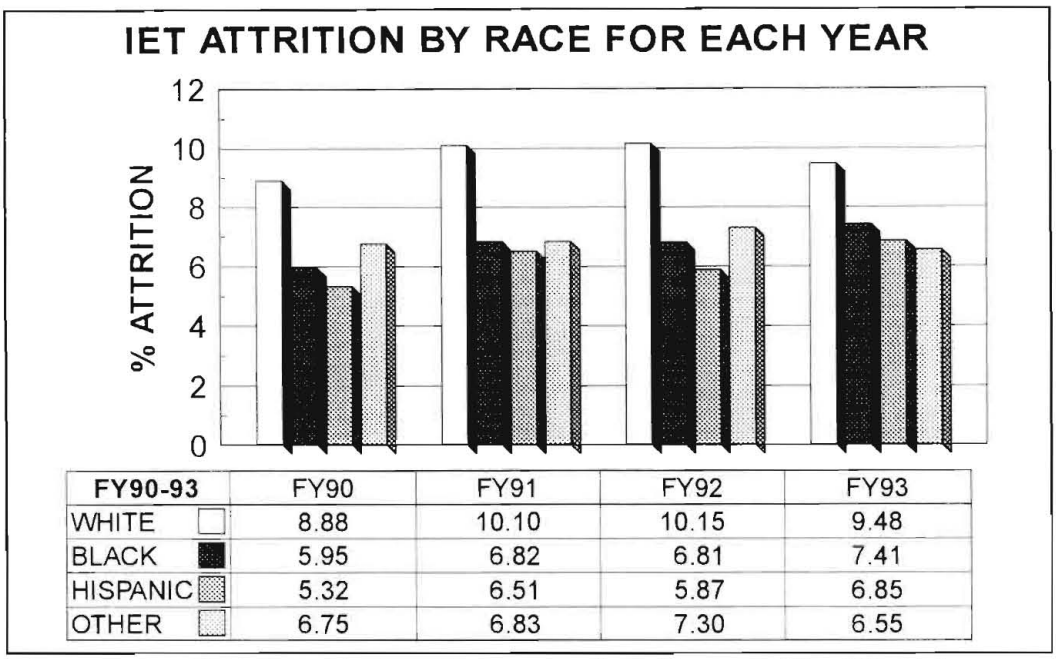
Total Accessions (Volume) = 75,000
Service Mix = 70,000 Non-Prior Service (NPS)
= 5,000 Prior Service (PS)
Quality Mix for NPS accessions
≥ 95% must be high school graduates (HSDG)
≥ 67% must score in the top 50th percentile on the AFQT (NPS-A)
≤ 2% can score between the 21st and 30th percentile on the AFQT (TSC-4)*
Gender Mix for NPS accessions
≥ 14.8% must be female

* Current policy restricts TSC-4 to scores between the 26th and 30th percentile.

results conducted by USAREC[2]. Figure 9 illustrates that the average age for *WHITES* may be somewhat lower than the other races, thus explaining why their attrition rate is higher. DCSPER analysts saw similar enlistment trends upon examining interview responses from the 1993 DoD Survey of Personnel Entering the Military Service (AFEES).

One recruiting technique used by USAREC to enhance certain jobs and influence undecided possible recruits is the enlistment bonus. The number of bonus recipients has dwindled considerably since 1990 when over 10,000 bonuses

[2]Obtained from 1993 Youth Attitude and Tracking Survey (YATS) results, which targets high school seniors.



FY90-93	FY90	FY91	FY92	FY93
WHITE	8.88	10.10	10.15	9.48
BLACK	5.95	6.82	6.81	7.41
HISPANIC	5.32	6.51	5.87	6.85
OTHER	6.75	6.83	7.30	6.55

Figure 8 IET Attrition by Race For Years (FY 90-93)

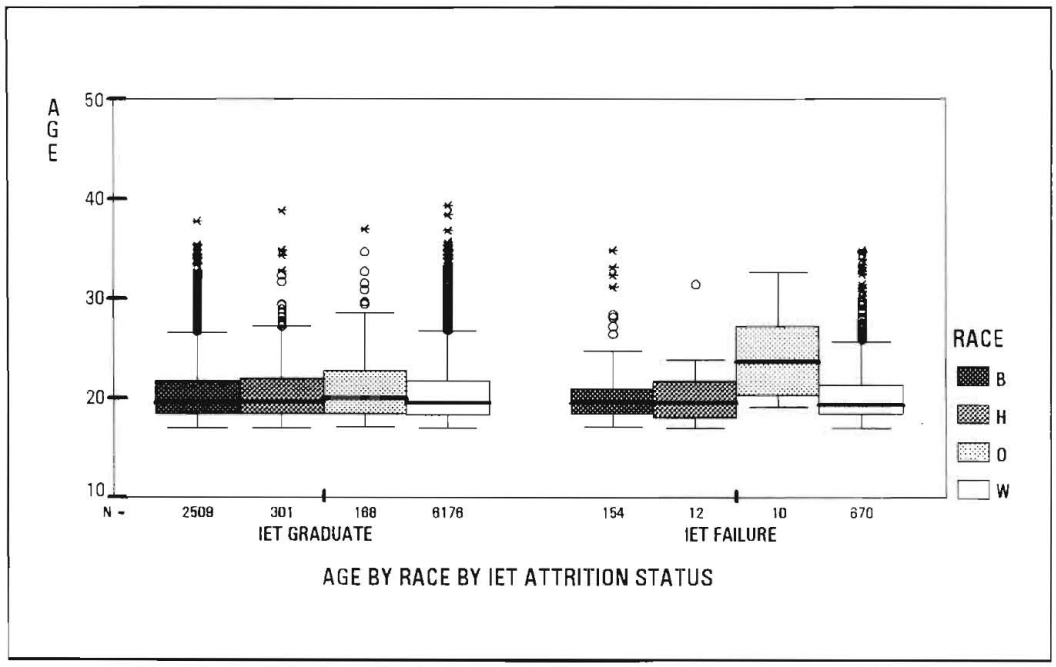


Figure 9 Box Plot of Average Age by Race and IET Status

were granted at enlistment. In FY93 3242 bonuses were handed out, this is just over 4 percent of the total population. It would seem likely that these bonus recipients would have a greater desire to complete their training. Figure 10 tells us that just the opposite is true. In each FY, personnel accepting a bonus have a higher attrition rate than for those who do not receive a bonus.

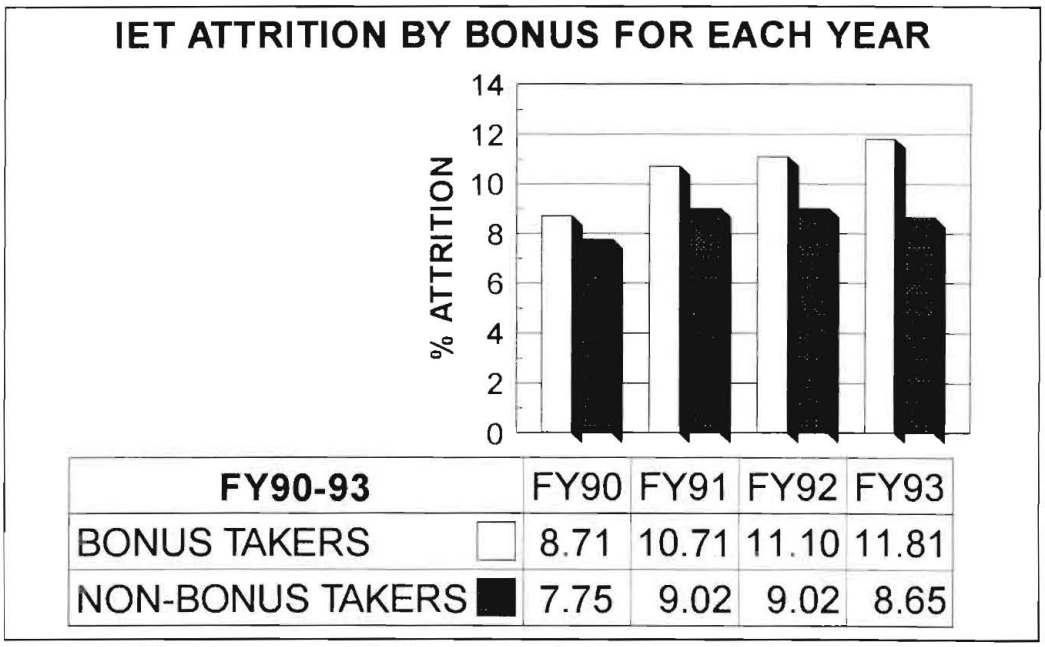
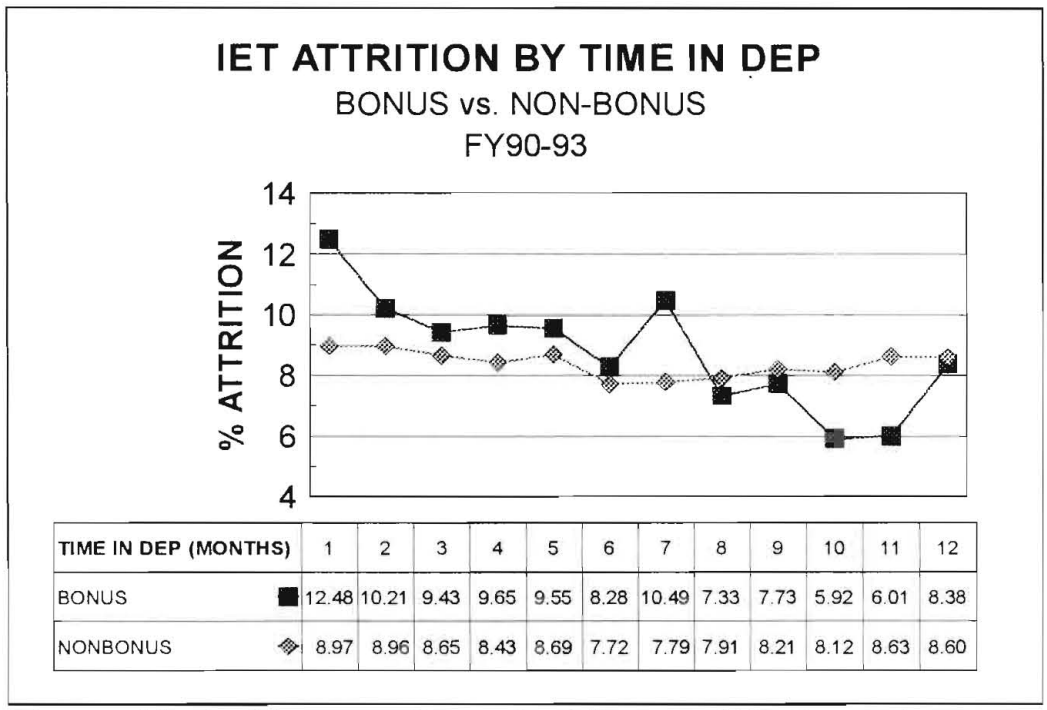


Figure 10 Bonus Recipients and IET Attrition Rates

Another interesting point for enlistment bonus receivers is that in each of the last four FY's the IET attrition rates for bonus takers is increasing. Figure 11 shows us an almost perfect inverse relationship for bonus takers. As the time in DEP increases, the chance of IET attrition

decreases. Since enlistment bonuses are primarily used to encourage enlistments in less desirable occupations, it is necessary to conduct an analysis of military job skills or MOS's which may help explain the bonus phenomenon.



TIME IN DEP (MONTHS)	1	2	3	4	5	6	7	8	9	10	11	12
BONUS	12.48	10.21	9.43	9.65	9.55	8.28	10.49	7.33	7.73	5.92	6.01	8.38
NONBONUS	8.97	8.96	8.65	8.43	8.69	7.72	7.79	7.91	8.21	8.12	8.63	8.60

Figure 11 Enlistment Bonus by Time in DEP Comparison

The data contained in the mini-master file under the variable heading TMOS consists of a two digit number followed by a letter. This number/letter code identifies the MOS of each enlistee. Table V shows a list of combat arms branches and their corresponding MOS codes. A complete listing of these MOS's and their specific operational skills are found in many of the Army's publications like the

Table V Combat Arms MOS's

COMBAT ARMS BRANCHES OF ARMY	MOS CODES
Aviation (AV)	14J
Air Defense Artillery (ADA)	16H-16X
Armor (AR)	19D-19X
Engineer (EN)	12B-12F
Field Artillery (FA)	13B-13R
Infantry (IN)	11B-11X
Special Forces (SF)	18B-18F

Enlisted Ranks Update. Figure 12 illustrates that about half of the total accession mission for each year is made of combat arms MOS's.

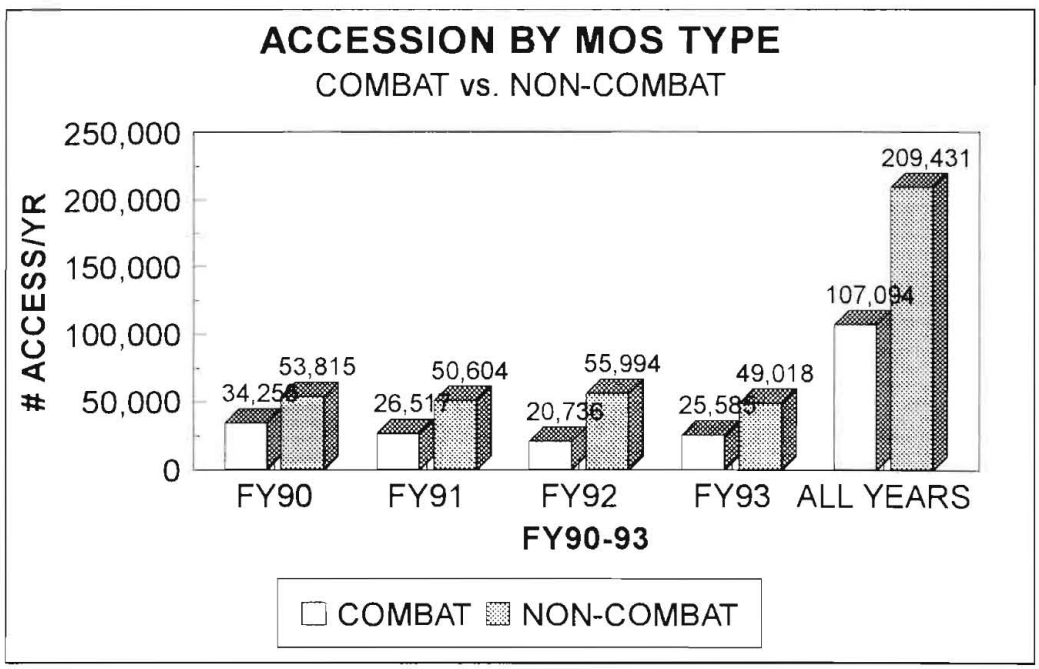


Figure 12 Number of Accessions by MOS Type

Historically, many of the combat related jobs have less desirable occupational skills and offer bonuses to maintain

required troop strengths. Figure 13 graphically illustrates which MOS groups receive the most bonuses and identifies certain MOS codes which require further analysis.

Additional investigation shows that the number of bonuses granted for the Infantry MOS (11B-11X) is about one-fifth of the total number of bonuses given.

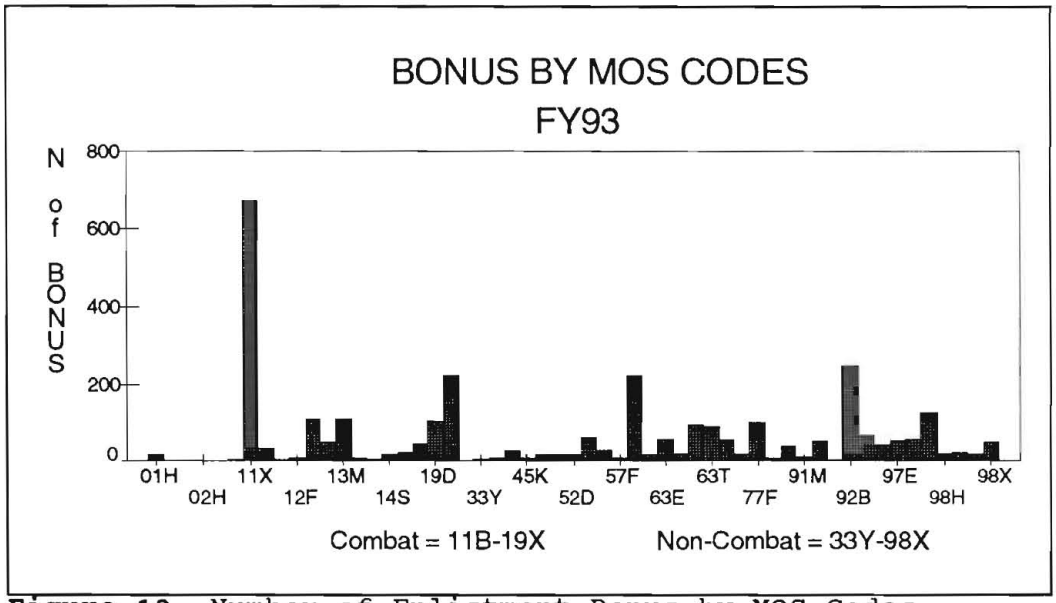
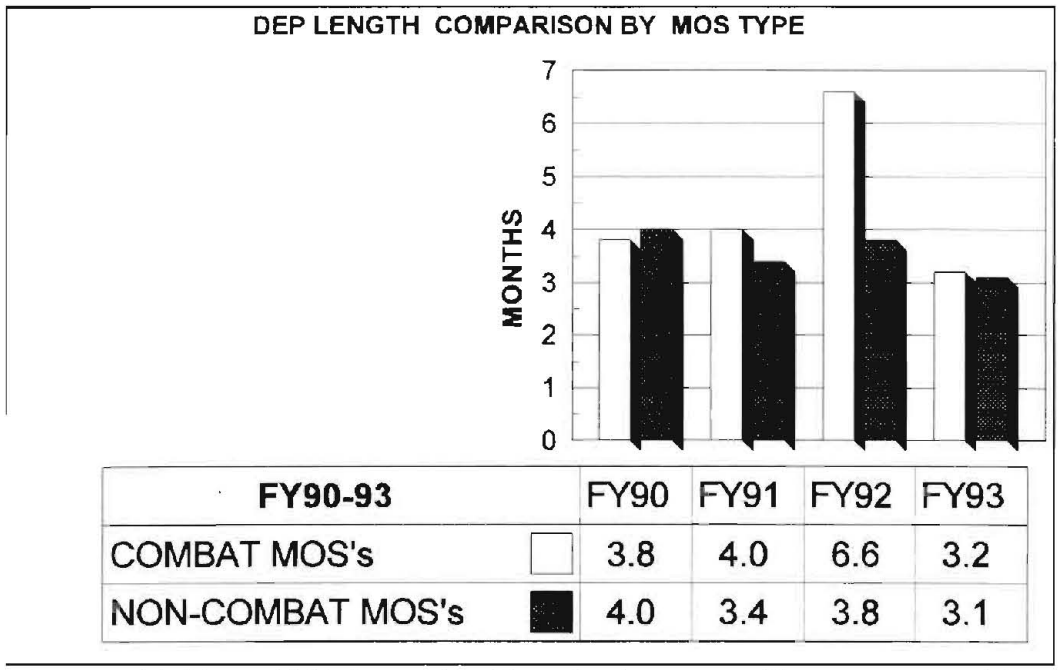


Figure 13 Number of Enlistment Bonus by MOS Codes

With respect to DEP, high value jobs tend to have longer queues. As a result, we would expect that average DEP lengths for combat arms branches would be shorter than the DEP lengths for non-combat arms branches. Figure 14 illustrates the average DEP lengths of each of these groups and shows that in the past three years the mean DEP lengths

for Combat Arms skills are greater than the mean DEP lengths of non-combat arms jobs. This refutes the previous hypothesis and shows that there is a great deal of

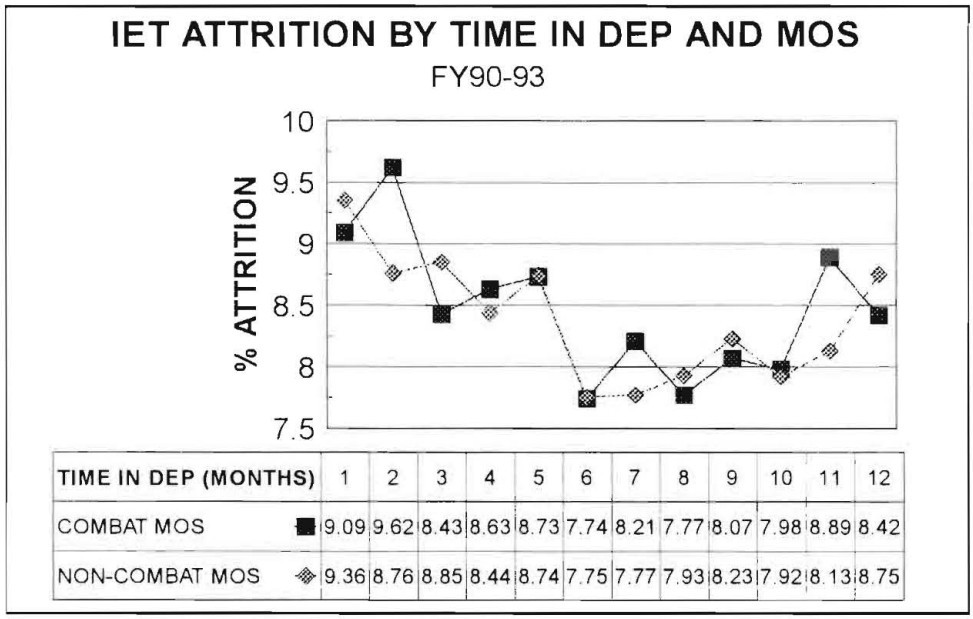


FY90-93	FY90	FY91	FY92	FY93
COMBAT MOS's	3.8	4.0	6.6	3.2
NON-COMBAT MOS's	4.0	3.4	3.8	3.1

Figure 14 Mean DEP Lengths For Combat vs. Non-combat MOS

variability in yearly DEP pools and from year to year comparisons. Figure 15 attempts to explain the relationship between combat and non-combat arms branches and their IET attrition rates at monthly DEP points. This Figure further exemplifies the variability in each month of DEP and shows that each of the groups seem to have similar attrition effects with respect to the DEP.

Since the combat arms MOS's are not homogeneous to the non-combat arms MOS's, we will attempt to model them both



TIME IN DEP (MONTHS)	1	2	3	4	5	6	7	8	9	10	11	12
COMBAT MOS	9.09	9.62	8.43	8.63	8.73	7.74	8.21	7.77	8.07	7.98	8.89	8.42
NON-COMBAT MOS	9.36	8.76	8.85	8.44	8.74	7.75	7.77	7.93	8.23	7.92	8.13	8.75

Figure 15 IET Attrition by Time in DEP and MOS

together in the saturated model and as two separate groups. A detailed explanation of the model fitting process is described later in Chapter IV.

Other demographic variables considered as potential indicators of IET attrition included age at enlistment, Armed Forces Qualification Test (AFQT) score, and education expectations.

The average age of someone not completing IET was compared to the average age of all incoming accessions by year. Figure 16 illustrates this simple comparison and shows that the average ages of the two groups are *almost* identical in each year. This is further exemplified by taking a random sample of 5000 recruits from all years and

comparing the average age of IET failures versus IET graduates as shown in Figure 17. Thus, initially there appears to be no significant indication of attrition at IET when age is included in the model.

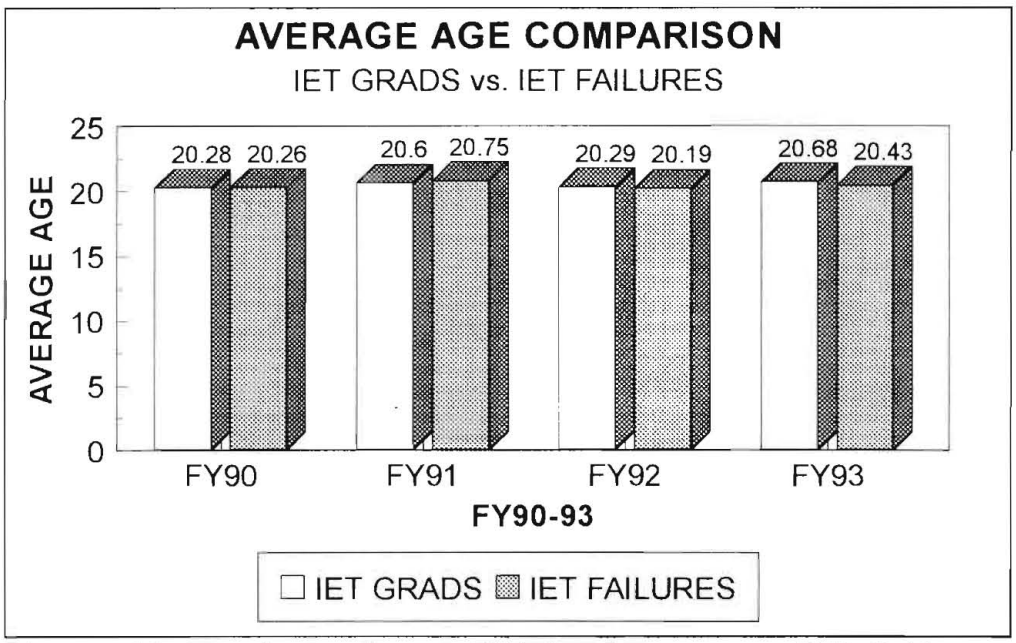


Figure 16 Age Comparison, IET Graduates vs. IET Failures

Another variable considered in previous studies was the AFQT score. This score is a composite of a subset of the individual ASVAB (Armed Services Vocational Aptitude Battery) component scores, reflecting language and arithmetic skills, and is used as a measure of general aptitude. Persons in the lowest AFQT category (percentiles 1 through 9) are by law ineligible to enlist [Ref.12].

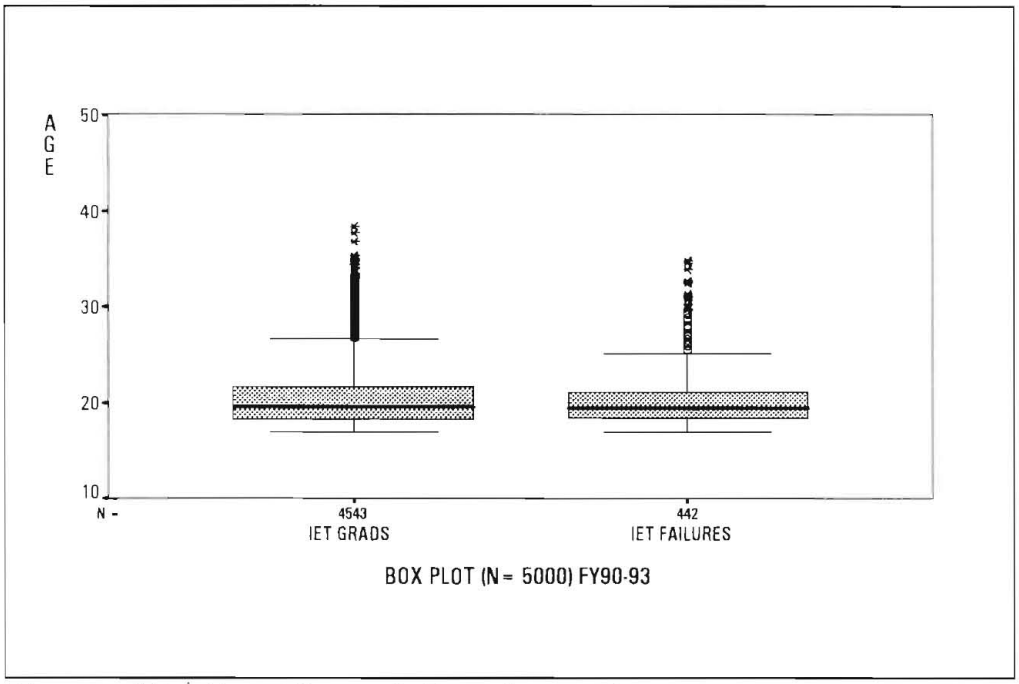


Figure 17 Box Plot of Age Comparison

Persons with higher AFQT scores are eligible to enlist but the specific job choices confronting them depend on their ASVAB component scores, such as mechanical, electrical and clerical aptitudes. If we view the AFQT score as a measure of trainability, then the higher the score, the more likely the individual will successfully complete training in whatever skill he enters. Thus, persons with high AFQT scores are more likely to be eligible for a large number of highly valued jobs like a computer programmer or a nuclear technician. As such, we would expect that persons with higher AFQT's should be more adept at their tasks and so less likely to be let go during IET. Figure 18 shows that

the average AFQT score for individuals making it through IET is almost 2 percent better per year than persons who attrite during IET. This confirms the hypothesis that AFQT should be used as an attrition indicator in our model. Its significance to the model will be discussed later.

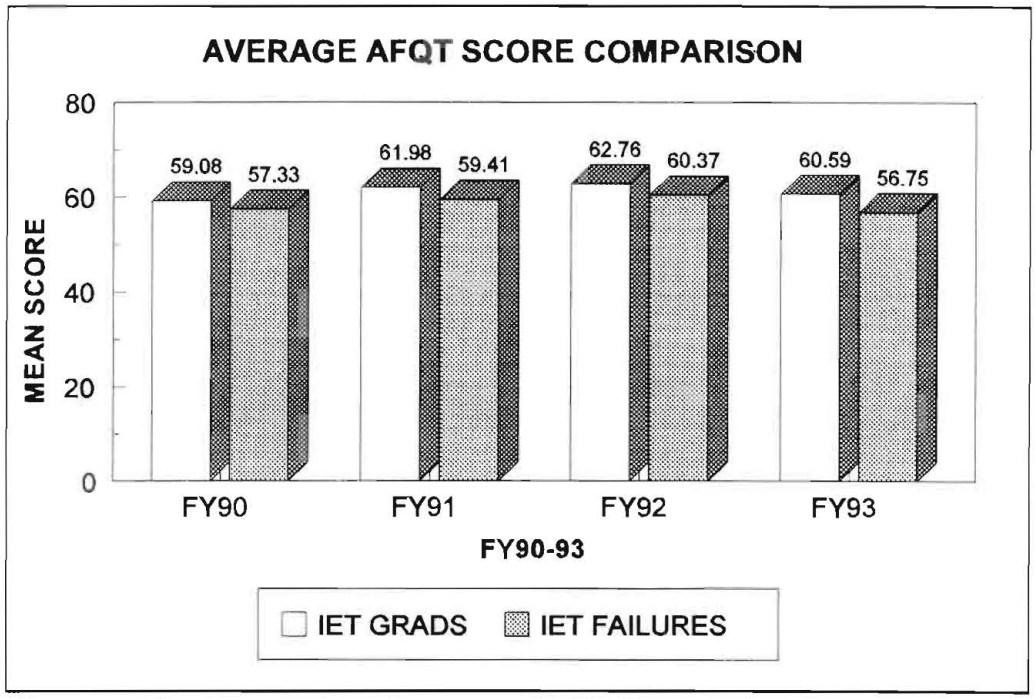


Figure 18 Comparing Average AFQT Scores by Year

IV. MODEL IMPLEMENTATION AND RESULTS

A. LOGISTIC REGRESSION MODEL

To further study the relationship between the effect of other factors in the DEP and IET attrition, we use the logistic regression model. Here the response variable is the dichotomous variable that indicates whether individuals will be lost during IET and the explanatory variables include age of enlistee, AFQT score, enlistment bonus, combat arms MOS, gender, education level, race, and time in the DEP. Note that for the logistic regression model, the binomial distribution describes the distribution upon which the analysis will be based.

A logistic regression model is used to model the relationship between a dichotomous outcome variable Y (dependent or response variable) and a set of independent (predictor or explanatory) variables $x_1, x_2, \ldots, x_p$ [Ref.13]. For the case of a single independent variable x, the logistic regression model can be written as:

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}}, \qquad (1)$$

where $\pi(x) = E(Y|x)$ and β_0 and β_1 are coefficients to be estimated from the data.

For p predictor variables, $x_1, x_2, \ldots, x_p$, the logistic regression model is written as:

$$\pi(x) = \frac{e^{g(x)}}{1 + e^{g(x)}}, \qquad (2)$$

where $g(x)$ is the linear combination:

$$g(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_p x_p ,$$

and where $\beta_0, \beta_1, \beta_2, \ldots, \beta_p$ are the unknown parameters to be estimated.

B. VARIABLE SELECTION

SPSS[3] version 5.1 for Windows, and SAS[4] version 6 for the NPS mainframe, were used to fit the model. The first step of the construction process involved data manipulation as discussed in Chapter II. The data was partitioned by year for each of the four years considered in the study. The next step in the process involved variable selection. A

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[3]SPSS is a comprehensive and flexible statistical analysis and data management system developed for the Windows PC environment by SPSS Incorporated from Chicago, Illinois.

[4]SAS version 6 for mainframe computing is a statistical analysis and data management package developed by statisticians in Cary, North Carolina.

detailed empirical analysis of the demographic variables was examined in Chapter III.

The selection process begins with a careful univariate analysis of each variable. The univariate logistic regression model was fit for each year separately and for all years combined for each of the variables identified in the previous chapter. The results of fitting the univariate model to these data for all years is given in Table VI. Each of the explanatory variables was fit separately as a continuous variable with the outcome variable *ATTRITION*. Table VI contains the following information: (1) the estimated slope coefficient for the univariate logistic regression model containing only this variable, (2) the estimated standard error of the estimated slope coefficient, (3) the estimated odds ratio, which is obtained by exponentiating the estimated coefficient, (4) the value of minus two times the log-likelihood for the model, (5) the likelihood ratio test statistic, G, which tests the null hypothesis constant model versus the alternative hypothesis with one variable, and (6) the p-value for the likelihood ratio test.

Table VI UNIVARIATE LOGISTIC REGRESSION MODEL

Variable	$\hat{\beta}$	SE($\hat{\beta}$)	$\hat{\psi}$	-2(LogL)	G	p-val
Constant	2.352	.006		186927.1		
AGE	0.01	0	1	186921.4	5.74	.0001
AFQT	0.01	0	1	186435.1	491.9	.0001
BONUS	-0.2	0.02	0.9	186882.5	44.57	.0001
COMBAT	-.025	.027	0.99	186732.7	194.43	.0001
GENDER	0.41	0.02	1.5	186294.5	632.5	.0001
HS SENIOR	0.08	0.02	1.1	186896.1	30.95	.0001
HS GRAD	-0.2	0.01	0.8	186720.5	206.6	.0001
PRIORSER	1.94	.067	6.93	185249.8	1677.3	.0001
BLACK	0.35	0.02	1.4	186454.8	472.3	.0001
HISPANIC	.402	.030	1.49	186729.7	197.38	.0001
OTHER	0.27	0.04	1.3	186879.9	47.23	.0001
TIMEDEP	0.02	0	1	186877.5	49.61	.0001

Variables were selected for the multivariate analysis if their univariate tests yield *p*-values of less than 0.05. All of the variables chosen had *p*-values less than 0.05 when modeling the years both combined and separately, except in FY92 when four variables; *HS GRAD*, *HS SENIOR*, *AGE*, and *TIMEDEP* displayed *p*-values greater than 0.05. Table VII displays the variables with *p*-values greater than 0.05 when conducting the univariate analysis in FY92. Clearly AGE and TIMEDEP are insignificant for FY92, but since their *p*-values

are less than 0.05 for all years other than this one, they will be initially included in the multivariate model.

Table VII UNIVARIATE MODEL FOR FY92

Variables	β	G	p-value
HS GRAD	-0.053	3.3	0.0712
HS SENIOR	-0.057	3.768	0.0513
AGE	0.0027	0.485	0.4871

Table VIII shows the variables selected at the onset of fitting the multivariate model. The model contains all of the variables from Table VI except for those already identified from the empiracle analysis as having little or no impact on IET attrition, and includes any felt to have some effect on the outcome when all the variables are included together. This will be called the full model in our discussion.

The importance of each variable included in the model was verified by comparing the estimated coefficient from the univariate model containing only that variable, with the coefficient from the full multivariate model.

Table VIII LIST OF LOGISTIC REGRESSION MODEL VARIABLES

EXPLANATORY VARIABLES	SYMBOL	LEVELS	TYPE
Age of enlistee	AGE	Continuous, No Level	NUMERICAL
Enlistment Bonus	BONUS	Yes, No (1,0)	CATEGORICAL
Time in DEP	TIMEDEP	1,...,12	ORDINAL
Gender	SEX	Male=1, Female =0	CATEGORICAL
Ethnic Race	RACE	White, Black, Hispanic, Other (0,...,3)	CATEGORICAL
Armed Forces Qualification Test	AFQT	Continuous Scale, No Level	ORDINAL
Education Level	NBOX	HSGRAD,HSSENIOR, PRIORSER (1-23)	CATEGORICAL
Training MOS	TMOS	Combat,Non-	CATEGORICAL

All variables in Table IX have Wald statistics with very small (less than 0.001) *p*-values. Therefore, all of the variables are left in the model.

Table IX MULTIVARIATE MODEL SELECTION COMPARISON

Variable	$\hat{\beta}$ Univariate	$\hat{\beta}$ Full	Wald	p-value
AGE	0.01	-0.02	60	.0001
AFQT	0.01	0.01	945	.0001
BONUS	-0.2	-0.16	45	.0001
COMBAT	-0.03	-0.05	12	.0005
GENDER	0.41	0.50	831	.0001
HS SENIOR	0.08	0.44	142	.0001
HS GRAD	-0.21	0.48	238	.0001
PRIORSER	1.94	2.45	1112	.0001
BLACK	0.35	0.61	1157	.0001
HISPANIC	0.40	0.63	414	.0001
OTHER	0.27	0.49	146	.0001
TIMEDEP	0.02	0.01	20	.0001

C. FITTING

SAS provides two criteria for assessing model fit, they are the Score statistic, and the residual deviance G. This deviance measure is -2 times the difference of the log-likelihood of the fitted and the model with just the intercept only. The ratio between G and -2 times the log-likelihood of the intercept only model, known as the likelihood ratio index is also used to assess the fit of the model. This index is similar to R^2 in multiple regression

and provides a measure of how much of the variability in the data is explained by the variables in the fitted model.

The statistic G tests the null hypothesis of the intercept model versus the alternative of the model of interest. Under the null hypothesis, and when the sample size is large, G has an approximately χ^2 distribution with p degrees of freedom where p is the number of variables in the model under the alternative hypothesis. Therefore, if the model fit is good, asymptotically the expected deviance is p [Ref.14].

For the model under consideration the G statistic is 4740.332 with 12 degrees of freedom and a p-value of 0.0001. This indicates that these variables explain more variability in attrition rate than does the constant model. On the other hand, the likelihood ratio index is:

$$\frac{4740.33}{186,863.54} = 0.025,$$

so that most of the variability in attrition rates is still unexplained by these variables. Several more models were fit which included interaction terms but none of these new variables had statistically significant p-values. As such they were not added to the final model.

In an attempt to model the decrease and then the increase in attrition as a function of time in DEP, a quadratic and a cubic term were fit. The likelihood ratio test statistic for the quadratic term is 47.39 with 1

degree of freedom and a p-value of less than 0.0001. Adding a cubic term gives a likelihood ratio statistic (testing the null model with just the linear time DEP term versus the alternative model with the quadratic and cubic terms) of 0.45 with 1 degree of freedom and a p-value of 0.50.

TIMEDEP was also categorized into three levels, 0-6 months, 7-9 months and 10-12 months. These 3 levels were coded as the two variables *TIMEDEP1*, which is 1 if TIMEDEP is between 0 and 6 months and TIMEDEP2, which is 1 if TIMEDEP is between 7 to 9 months. These levels were chosen by looking at the plots of attrition versus TIMEDEP (eg. Figure 3 and Figure 5) which tend to be decreasing for TIMEDEP less than 6 months and increasing for TIMEDEP greater than 10 months.

The G statistic for TIMEDEP with three levels is 4729.3 with 13 degrees of freedom and a p-value of 0.0001. Because the G statistic with TIMEDEP added to be a numeric variable with a quadratic term is larger than the G statistic with TIMEDEP as a categorical variable, the polynomial version of TIMEDEP is used in the final model.

D. FINAL MODEL

The final model can be parameterized as:

$$logit\ (P_{ijklm}) = \alpha + \beta_1^D x(TDEP) + \beta_2^D x(TDEP)^2 + \beta_j^B + \beta_k^C + \beta_l^G + \beta_m^R + \beta^A x(AGE) + \beta^{AF} x(AFQT) + \beta_n^E,$$

where P_{ijklm} is the probability of IET attrition for individuals of a specific age (AGE) and with a specific AFQT score (AFQT) and where j = 1,2 for bonus recipients respectively ($\beta_2^B \equiv 0$); k = 1,2 for combat and non-combat MOS respectively ($\beta_2^C \equiv 0$); l = 1,2 for males and females respectively ($\beta_2^G \equiv 0$); m = 1,2,3,4 for Other, Black, Hispanic and White respectively ($\beta_4^G \equiv 0$); β^A and β^{AF} are the coefficients for the continuous variables AGE and AFQT score; n = 1,2,3,4 for high school senior, high school graduate and prior service and other respectively ($\beta_4^E \equiv 0$). Table X gives the estimated coefficients as well their standard errors, Wald Statistics, odds ratio and p-values.

We note that attempts at categorizing AFQT and adding other variables describing MOS such as separating Infantry MOS from the others did not improve model fit. Models with three-way or higher interactions were not tried because they are almost impossible to fit computationally and because it was felt that further terms would not shed any more light on the relationships between these variables and IET attrition rates.

Table X FINAL MODEL OUTPUT

Variable	$\hat{\beta}$	SE($\hat{\beta}$)	Wald	$\hat{\psi}$	p-value
α	0.866	0.066	177.6	2.38	.0001
β_1^R(BONUS)	-0.152	0.024	39.7	0.86	.0001
$\beta_1^{\cdot}$ (COMBAT)	-0.047	0.015	10.7	0.95	.0011
$\beta_1^{\cdot}$(MALE)	0.499	0.017	842.9	1.65	.0001
β_1^E(OTHER)	0.486	0.040	144.8	1.63	.0001
β_2^E(BLACK)	0.609	0.018	1152.5	1.84	.0001
β_1^E(HISPANIC)	0.623	0.030	411.1	1.86	.0001
$\beta^{\wedge}$(AGE)	-0.018	0.002	58.6	0.98	.0001
β^{AF}(AFQT)	0.012	0.001	928.5	1.01	.0001
β_1^F(HSSENIOR)	0.451	0.037	148.0	1.57	.0001
β_1^F(HSGRAD)	0.476	0.031	233.8	1.62	.0001
β_1^F(PRIORSER)	2.467	0.074	1123.7	11.79	.0001
β_1^D(TIMEDEP)	0.058	0.007	66.4	1.06	.0001
β_2^D(TIMEDEP)^2	-0.004	0.001	48.0	1.00	.0001

E. RESULTS

This model described in Equation (5) was fit separately for male and females, combat versus non-combat MOS's, and Infantry versus non-Infantry MOS's for all years. Additionally, this base model was fit for each year independently.

The model identified several different trends and variable aspects with respect to attrition from year to year

but failed to explain much of the variance involved. The best fit of all these attempts had a likelihood ratio index of about 0.035. Because this index is so low, ie only 3.5 percent of the variability in attrition rates is explained by the model, conclusions and recommendations are based on graphical and empirical results given in the previous section.

V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The dramatic increase in first-term attrition observed over the past few years was not seen for IET attritions. In fact, IET attritions have decreased slightly over the past two years. As a whole, the time a potential recruit spends in the Delayed Entry Program is not as significant an indicator of attrition as some other aspects of enlistment. However, on the average, most groups that have higher attrition rates tend to spend less time in the DEP. For almost every category of recruit, IET attrition rates are lowest for cohorts spending between six to eight months in the DEP. The attrition rates tend to increase for cohorts spending less than six months and greater than 8 months in the DEP. On average, personnel who spent one month or less on DEP had the highest attrition rates during Initial Entry Training.

Recruits who accept enlistment bonuses are more likely to attrite than those who do not accept bonuses. Whites have higher attrition rates than any of the other races, although for blacks, attrition rates have been increasing over the past four years. Females have higher attrition rates than males but exhibit similar distributions for DEP

time. Enlistees who score above 60 on their AFQT have a much greater chance of completing IET than someone who scored lower than 60.

Combat Arms MOS's have an overall lower average attrition rate and longer average DEP lengths although the trend for the last two years has seen the opposite. The Infantry MOS's access almost half of the total combat arms MOS's. Although the attrition rates for Infantry MOS's are about 3 percent higher than for non-combat MOS's, over the past two years, their attrition rates over all years are similar to the IET population in general. The final conclusion is that there are many factors in the enlistment process, such as AFQT score, gender and education level, which explain more about IET attrition then the time an individual spends in the DEP.

B. RECOMMENDATIONS

1. Increase the minimum DEP length to at least three months, but no more than ten months.

The longer DEP periods apply more directly to high school seniors, who exhibit lower attrition rates on average than any other education level. Still, by eliminating DEP periods of over 10 months their attrition rates during IET and during DEP would be lower.

2. Eliminate enlistment bonuses or open more enlistment bonus areas to more higher valued jobs.

As it stands, the Army is losing on both accounts with enlistment incentives because they are paying the bonuses to recruits more likely to exit the service during IET.

3. Increase the role a recruiter plays in the DEP training of signed contracts.

This might even include a mandatory follow-up check by the recruiter at an IET training site to track soldiers he contracted for their first six months of training. This type of recruiter/recruit tracking is currently being conducted by the U.S. Marine Corps recruiters.

Finally, 4. Limit the number of training cycles or distribute the accession dates over the year to smooth out the seasonal fluctuations in training.

IET ATTRITION BY TIME IN DEP FOR FEMALES

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	228	1798	12.68%	566	3808	14.86%	301	2406	12.51%	143	1501	9.53%	1238	9513	13.01%
2	336	2586	12.99%	238	1820	13.08%	191	1770	10.79%	402	3373	11.92%	1167	9549	12.22%
3	353	3073	11.49%	150	1105	13.57%	235	1748	13.44%	330	2867	11.51%	1068	8793	12.15%
4	206	1921	10.72%	131	1142	11.47%	285	2428	11.74%	171	1712	9.99%	793	7203	11.01%
5	83	811	10.23%	117	1135	10.31%	233	2157	10.80%	77	705	10.92%	510	4808	10.61%
6	106	923	11.48%	80	677	11.82%	72	754	9.55%	55	524	10.50%	313	2878	10.88%
7	71	595	11.93%	59	592	9.97%	28	296	9.46%	25	313	7.99%	183	1796	10.19%
8	43	475	9.05%	39	373	10.46%	69	483	14.29%	30	256	11.72%	181	1587	11.41%
9	30	287	10.45%	31	262	11.83%	15	209	7.18%	23	266	8.65%	99	1024	9.67%
10	29	230	12.61%	14	194	7.22%	12	87	13.79%	29	208	13.94%	84	719	11.68%
11	9	134	6.72%	7	64	10.94%	9	60	15.00%	10	95	10.53%	35	353	9.92%
12	17	172	9.88%	7	45	15.56%	6	39	15.38%	8	56	14.29%	38	312	12.18%
TOTALS	1511	13005	11.62%	1439	11217	12.83%	1456	12437	11.71%	1303	11878	10.97%	5709	48535	11.76%

IET ATTRITION BY TIME IN DEP FOR MALES

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	920	11723	7.85%	1671	18406	9.08%	713	7982	8.93%	765	9630	7.94%	4069	47741	8.52%
2	1038	14376	7.22%	880	9886	8.90%	614	7698	7.98%	1787	19026	9.39%	4319	50986	8.47%
3	929	13944	6.66%	343	4333	7.92%	819	9218	8.88%	1139	13066	8.72%	3230	40561	7.96%
4	575	7779	7.39%	510	6087	8.38%	949	11855	8.01%	458	5739	7.98%	2492	31460	7.92%
5	346	4118	8.40%	614	7297	8.41%	1007	11375	8.85%	209	3160	6.61%	2176	25950	8.39%
6	265	3949	6.71%	319	4006	7.96%	249	3426	7.27%	171	2750	6.22%	1004	14131	7.10%
7	189	2930	6.45%	344	4193	8.20%	169	1846	9.15%	88	1522	5.78%	790	10491	7.53%
8	263	3917	6.71%	253	3295	7.68%	232	2953	7.86%	128	1681	7.71%	876	11826	7.41%
9	242	3413	7.09%	176	2196	8.01%	89	1165	7.64%	205	2124	9.65%	712	8898	8.00%
10	199	2907	6.85%	110	1588	6.93%	86	852	10.09%	169	2095	8.07%	564	7442	7.58%
11	188	2569	7.32%	135	1623	8.32%	289	2866	10.08%	75	1131	6.63%	687	8189	8.39%
12	264	3441	7.67%	243	2994	8.12%	306	3057	10.01%	61	823	7.41%	874	10315	8.47%
TOTALS	5418	75066	7.22%	5598	65904	8.49%	5522	64293	8.59%	5255	62727	8.38%	21793	267990	8.13%

APPENDIX FY90-93 PERCENT ATTRITION FOR COMBAT AND NON-COMBAT MOS

IET ATTRITION BY TIME IN DEP FOR COMBAT MOS's

DEP	FY90			FY91			FY92			FY93			FY90-93		
	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	476	5820	8.18%	617	7140	8.64%	223	2172	10.27%	457	4371	10.46%	1773	19503	9.09%
2	542	6864	7.90%	374	4197	8.91%	187	1924	9.72%	854	7358	11.61%	1957	20343	9.62%
3	410	6746	6.08%	137	1597	8.58%	279	2731	10.22%	569	5474	10.39%	1395	16548	8.43%
4	219	3191	6.86%	194	2178	8.91%	404	4112	9.82%	184	2119	8.68%	1001	11600	8.63%
5	136	1940	7.01%	218	2591	8.41%	399	3878	10.29%	78	1114	7.00%	831	9523	8.73%
6	120	1751	6.85%	134	1670	8.02%	89	1049	8.48%	89	1113	8.00%	432	5583	7.74%
7	83	1221	6.80%	136	1644	8.27%	83	768	10.81%	46	606	7.59%	348	4239	8.21%
8	124	1778	6.97%	96	1336	7.19%	58	668	8.68%	67	657	10.20%	345	4439	7.77%
9	85	1364	6.23%	55	817	6.73%	20	237	8.44%	118	1027	11.49%	278	3445	8.07%
10	65	1066	6.10%	42	659	6.37%	38	306	12.42%	83	825	10.06%	228	2856	7.98%
11	69	916	7.53%	83	867	9.57%	123	1341	9.17%	48	511	9.39%	323	3635	8.89%
12	112	1599	7.00%	143	1821	7.85%	158	1550	10.19%	40	410	9.76%	453	5380	8.42%
TOTALS	2441	34256	7.13%	2229	26517	8.41%	2081	20738	9.94%	2633	25586	10.29%	9384	107094	8.74%

IET ATTRITION BY TIME IN DEP FOR NON-COMBAT MOS's

DEP	FY90			FY91			FY92			FY93			FY90-93		
	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	672	7701	8.73%	1620	15074	10.75%	791	8216	9.63%	451	6760	6.67%	3534	37751	9.36%
2	832	10098	8.24%	744	7509	9.91%	618	7544	8.19%	1335	15041	8.88%	3529	40192	8.78%
3	872	10271	8.49%	358	3841	9.27%	775	8235	9.41%	900	10459	8.61%	2903	32808	8.85%
4	562	6509	8.63%	447	5051	8.85%	830	10171	8.16%	445	5332	8.35%	2284	27063	8.44%
5	293	2989	9.80%	513	5841	8.78%	841	9654	8.71%	208	2751	7.56%	1855	21235	8.74%
6	251	3121	8.04%	265	3013	8.80%	232	3131	7.41%	137	2161	6.34%	885	11426	7.75%
7	177	2304	7.68%	267	3141	8.50%	114	1374	8.30%	67	1229	5.45%	625	8048	7.77%
8	182	2614	6.96%	198	2332	8.40%	243	2768	8.78%	91	1260	7.22%	712	8974	7.93%
9	187	2336	8.01%	152	1641	9.26%	84	1137	7.39%	110	1363	8.07%	533	6477	8.23%
10	163	2071	7.87%	82	1123	7.30%	60	633	9.48%	115	1478	7.78%	420	5305	7.92%
11	128	1787	7.16%	59	820	7.20%	175	1585	11.04%	37	715	5.17%	399	4907	8.13%
12	169	2014	8.39%	107	1218	8.78%	154	1546	9.96%	29	469	6.18%	459	5247	8.75%
TOTALS	4466	53815	8.34%	4806	50604	9.50%	4917	55994	8.78%	3925	49018	8.01%	18138	209431	8.66%

IET ATTRITION BY TIME IN DEP FOR 11B MOS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	186	2217	8.39%	291	3307	8.80%	99	896	11.05%	284	2642	10.75%	860	9062	9.49%
2	261	2873	9.08%	176	1961	8.98%	90	899	10.01%	470	3620	12.98%	997	9353	10.66%
3	203	3038	6.68%	75	835	8.98%	185	1382	13.39%	321	2670	12.02%	784	7925	9.89%
4	96	1310	7.33%	54	680	7.94%	231	2061	11.21%	105	1180	8.90%	486	5231	9.29%
5	69	945	7.30%	129	1106	11.66%	267	2002	13.34%	45	547	8.23%	510	4600	11.09%
6	77	933	8.25%	78	803	9.71%	54	480	11.25%	51	676	7.54%	260	2892	8.99%
7	49	609	8.05%	64	732	8.74%	63	552	11.41%	26	346	7.51%	202	2239	9.02%
8	64	751	8.52%	65	649	10.02%	32	350	9.14%	35	290	12.07%	196	2040	9.61%
9	45	568	7.92%	30	325	9.23%	13	107	12.15%	59	508	11.61%	147	1508	9.75%
10	38	464	8.19%	20	272	7.35%	37	245	15.10%	47	426	11.03%	142	1407	10.09%
11	34	420	8.10%	59	416	14.18%	75	745	10.07%	33	392	8.42%	201	1973	10.19%
12	66	817	8.08%	102	997	10.23%	113	985	11.47%	25	267	9.36%	306	3066	9.98%
TOTALS	1188	14945	7.95%	1143	12083	9.46%	1259	10704	11.76%	1501	13584	11.07%	5091	51298	9.92%

IET ATTRITION BY TIME IN DEP FOR ALL MOS LESS 11B

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	962	11304	8.51%	1946	18907	10.29%	915	9492	9.64%	624	8489	7.35%	4447	48192	9.23%
2	1113	14089	7.90%	942	9745	9.67%	715	8569	8.34%	1719	18779	9.15%	4489	51182	8.77%
3	1079	13979	7.72%	418	4603	9.08%	869	9584	9.07%	1148	13263	8.66%	3514	41429	8.48%
4	685	8390	8.16%	587	6549	8.96%	1003	12222	8.21%	524	6271	8.36%	2799	33432	8.37%
5	360	3984	9.04%	602	7326	8.22%	973	11530	8.44%	241	3318	7.26%	2176	26158	8.32%
6	294	3939	7.46%	321	3880	8.27%	267	3700	7.22%	175	2598	6.74%	1057	14117	7.49%
7	211	2916	7.24%	339	4053	8.36%	134	1590	8.43%	87	1489	5.84%	771	10048	7.67%
8	242	3641	6.65%	227	3019	7.52%	269	3086	8.72%	123	1627	7.56%	861	11373	7.57%
9	227	3132	7.25%	177	2133	8.30%	91	1267	7.18%	169	1882	8.98%	664	8414	7.89%
10	190	2673	7.11%	104	1510	6.89%	61	694	8.79%	151	1877	8.04%	506	6754	7.49%
11	163	2283	7.14%	83	1271	6.53%	223	2181	10.22%	52	834	6.24%	521	6569	7.93%
12	215	2796	7.69%	148	2042	7.25%	199	2111	9.43%	44	612	7.19%	606	7561	8.01%
TOTALS	5741	73128	7.85%	5894	65038	9.06%	5719	66026	8.66%	5057	61039	8.28%	22411	285229	8.45%

IET ATTRITION BY TIME IN DEP FOR BONUS RECIPIENTS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	206	1890	10.90%	271	2130	12.72%	70	484	14.46%	63	392	16.07%	610	4896	12.46%
2	244	2570	9.49%	118	1173	10.06%	28	303	9.24%	132	1069	12.35%	522	5115	10.21%
3	176	1999	8.80%	23	332	6.93%	53	447	11.86%	81	755	10.73%	333	3533	9.43%
4	71	760	9.34%	28	284	9.86%	60	637	9.42%	32	298	10.74%	191	1979	9.65%
5	26	347	7.49%	39	363	10.74%	58	601	9.65%	19	176	10.80%	142	1487	9.55%
6	19	275	6.91%	20	207	9.66%	12	120	10.00%	10	135	7.41%	61	737	8.28%
7	18	250	7.20%	17	147	11.56%	19	102	18.63%	6	73	8.22%	60	572	10.49%
8	25	412	6.07%	12	146	8.22%	11	114	9.65%	7	78	8.97%	55	750	7.33%
9	29	463	6.26%	8	116	6.90%	5	41	12.20%	15	117	12.82%	57	737	7.73%
10	23	488	4.71%	6	93	6.45%	2	8	25.00%	8	70	11.43%	39	659	5.92%
11	25	446	5.61%	4	84	4.76%	0	5	0.00%	5	31	16.13%	34	566	6.01%
12	57	651	8.76%	11	174	6.32%	1	11	9.09%	5	49	10.20%	74	885	8.36%
TOTALS	919	10551	8.71%	557	5249	10.61%	319	2873	11.10%	383	3243	11.81%	2178	21918	9.94%

IET ATTRITION BY TIME IN DEP FOR NON-BONUS RECIPIENTS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	942	11631	8.10%	1966	20084	9.79%	944	9904	9.53%	845	10739	7.87%	4697	52358	8.97%
2	1130	14392	7.85%	1000	10533	9.49%	777	9165	8.48%	2057	21330	9.64%	4964	55420	8.96%
3	1106	15018	7.36%	470	5106	9.20%	1001	10519	9.52%	1388	15178	9.14%	3965	45821	8.65%
4	710	8940	7.94%	613	6945	8.83%	1174	13646	8.60%	597	7153	8.35%	3094	36684	8.43%
5	403	4582	8.80%	692	8069	8.58%	1182	12931	9.14%	267	3689	7.24%	2544	29271	8.69%
6	352	4597	7.66%	379	4476	8.47%	309	4060	7.61%	216	3139	6.88%	1256	16272	7.72%
7	242	3275	7.39%	386	4638	8.32%	178	2040	8.73%	107	1762	6.07%	913	11715	7.79%
8	281	3980	7.06%	280	3522	7.95%	290	3322	8.73%	151	1839	8.21%	1002	12663	7.91%
9	243	3237	7.51%	199	2342	8.50%	99	1333	7.43%	213	2273	9.37%	754	9185	8.21%
10	205	2649	7.74%	118	1689	6.99%	96	931	10.31%	190	2233	8.51%	609	7502	8.12%
11	172	2257	7.62%	138	1603	8.61%	298	2921	10.20%	80	1195	6.69%	688	7976	8.63%
12	224	2962	7.56%	239	2865	8.34%	311	3085	10.08%	64	830	7.71%	838	9742	8.60%
TOTALS	6010	77520	7.75%	6480	71872	9.02%	6659	73857	9.02%	6175	71380	8.65%	25324	294809	8.60%

IET ATTRITION BY TIME IN DEP FOR WHITES

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	841	8784	9.57%	1712	15410	11.11%	732	6424	11.39%	658	7602	8.66%	3943	38220	10.32%
2	976	10400	9.38%	895	8563	10.45%	598	6170	9.69%	1678	15532	10.80%	4147	40665	10.20%
3	960	11161	8.60%	378	3683	10.26%	808	7388	10.94%	1068	10719	9.96%	3214	32951	9.75%
4	579	6313	9.17%	469	4760	9.85%	950	10063	9.44%	460	5064	9.08%	2458	26200	9.38%
5	325	3346	9.71%	553	5811	9.52%	1000	9725	10.28%	211	2709	7.79%	2089	21591	9.68%
6	265	3105	8.53%	326	3362	9.70%	251	2964	8.47%	177	2374	7.46%	1019	11805	8.63%
7	203	2365	8.58%	328	3453	9.50%	164	1641	9.99%	83	1349	6.15%	778	8808	8.83%
8	226	2972	7.60%	242	2686	9.01%	242	2578	9.39%	119	1392	8.55%	829	9628	8.61%
9	207	2603	7.95%	165	1795	9.19%	78	1017	7.67%	188	1776	10.59%	638	7191	8.87%
10	179	2203	8.13%	102	1380	7.39%	84	730	11.51%	160	1775	9.01%	525	6088	8.62%
11	155	1983	7.82%	127	1333	9.53%	253	2373	10.66%	75	1018	7.37%	610	6707	9.09%
12	239	2795	8.55%	222	2414	9.20%	277	2510	11.04%	57	718	7.94%	795	8437	9.42%
TOTALS	5155	58030	8.88%	5519	54650	10.10%	5437	53583	10.15%	4934	52028	9.48%	21045	218291	9.64%

IET ATTRITION BY TIME IN DEP FOR BLACKS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	231	3529	6.55%	365	4730	7.72%	211	2866	7.36%	164	2467	6.65%	971	13592	7.14%
2	309	4925	6.27%	155	2066	7.50%	142	2301	6.17%	359	4602	7.80%	965	13894	6.95%
3	238	4324	5.50%	81	1209	6.70%	184	2447	7.52%	275	3472	7.92%	778	11452	6.79%
4	151	2460	6.14%	124	1758	7.05%	199	2875	6.92%	125	1587	7.88%	599	8680	6.90%
5	63	1099	5.73%	121	1788	6.77%	149	2480	6.01%	57	747	7.63%	390	6114	6.38%
6	85	1266	6.71%	52	897	5.80%	39	798	4.90%	33	602	5.48%	209	3561	5.87%
7	34	820	4.15%	46	896	5.13%	20	321	6.23%	23	317	7.26%	123	2354	5.23%
8	56	1010	5.54%	32	669	4.78%	44	531	8.29%	22	340	6.47%	154	2550	6.04%
9	47	792	5.93%	26	479	5.43%	15	223	6.73%	23	382	6.02%	111	1876	5.92%
10	39	671	5.81%	18	268	5.97%	10	129	7.75%	27	357	7.56%	92	1425	6.46%
11	25	507	4.93%	11	212	5.19%	33	325	10.15%	7	131	5.34%	76	1175	6.47%
12	29	575	5.04%	20	412	4.85%	19	336	5.65%	4	88	4.55%	72	1411	5.10%
TOTALS	1307	21978	5.95%	1049	15384	6.82%	1065	15630	6.81%	1119	15092	7.41%	4540	68084	6.67%

IET ATTRITION BY TIME IN DEP FOR HISPANICS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	43	830	5.18%	99	1357	7.30%	46	751	6.13%	61	698	8.74%	249	3636	6.85%
2	58	1104	5.25%	42	713	5.89%	39	696	5.60%	103	1501	6.86%	242	4014	6.03%
3	50	1011	4.95%	26	363	7.16%	41	736	5.57%	77	1115	6.91%	194	3225	6.02%
4	30	592	5.07%	36	493	7.30%	51	886	5.76%	31	500	6.20%	148	2471	5.99%
5	22	333	6.61%	39	570	6.84%	49	997	5.46%	7	266	2.63%	117	2066	5.66%
6	20	345	5.80%	16	256	6.25%	20	275	7.27%	9	207	4.35%	65	1083	6.00%
7	14	223	6.28%	18	287	6.27%	10	115	8.70%	5	107	4.67%	47	732	6.42%
8	14	278	5.04%	8	185	4.32%	10	225	4.44%	12	131	9.16%	44	819	5.37%
9	14	197	7.11%	12	124	9.68%	9	104	8.65%	13	155	8.39%	48	580	8.28%
10	6	169	3.55%	3	89	3.37%	4	47	8.51%	9	113	7.96%	22	418	5.26%
11	9	158	5.70%	1	104	0.96%	8	168	4.76%	3	51	5.88%	21	481	4.37%
12	8	171	4.68%	5	145	3.45%	11	180	6.11%	6	60	10.00%	30	556	5.40%
TOTALS	288	5411	5.32%	305	4686	6.51%	298	5080	5.87%	336	4904	6.85%	1227	20081	6.11%

IET ATTRITION BY TIME IN DEP FOR OTHERS

	FY90			FY91			FY92			FY93			FY90-93		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	24	378	6.35%	61	717	8.51%	25	347	7.20%	25	364	6.87%	135	1806	7.48%
2	40	533	7.50%	26	364	7.14%	26	301	8.64%	49	761	6.44%	141	1959	7.20%
3	34	521	6.53%	7	183	3.83%	21	395	5.32%	49	627	7.81%	111	1726	6.43%
4	21	335	6.27%	13	218	5.96%	34	459	7.41%	13	300	4.33%	81	1312	6.17%
5	10	151	6.62%	18	263	6.84%	42	430	9.77%	11	143	7.69%	81	987	8.21%
6	10	156	6.41%	5	168	2.98%	11	145	7.59%	7	91	7.69%	33	560	5.89%
7	9	117	7.69%	11	149	7.38%	3	65	4.62%	2	62	3.23%	25	393	6.36%
8	10	132	7.58%	10	128	7.81%	5	102	4.90%	5	54	9.26%	30	416	7.21%
9	4	108	3.70%	4	60	6.67%	2	30	6.67%	4	77	5.19%	14	275	5.09%
10	4	94	4.26%	3	44	6.82%	0	33	0.00%	2	58	3.45%	9	229	3.93%
11	8	55	14.55%	3	39	7.69%	4	60	6.67%	0	26	0.00%	15	180	8.33%
12	5	72	6.94%	3	68	4.41%	5	70	7.14%	2	16	12.50%	15	226	6.64%
TOTALS	179	2852	6.75%	164	2401	6.83%	178	2437	7.30%	169	2579	6.55%	690	10069	6.85%

IET ATTRITION BY NBOX CATEGORY

	FY90			FY91			FY92			FY93			FY90-93		
NBOX	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	888	13566	6.55%	1194	15339	7.78%	1398	15207	9.19%	840	11373	7.39%	4320	55485	7.79%
2	1974	28951	6.82%	2473	29285	8.44%	2750	34159	8.05%	2014	25623	7.86%	9211	118018	7.80%
3	572	7421	7.71%	305	2979	10.24%	125	1392	8.98%	310	3431	9.04%	1312	15223	8.62%
4	1288	15460	8.33%	1290	12537	10.29%	1217	11906	10.22%	1285	11800	10.89%	5080	51703	9.83%
5	0	0	0.00%	0	1	0.00%	0	2	0.00%	0	0	0.00%	0	3	0.00%
6	120	1549	7.75%	71	666	10.66%	31	262	11.83%	201	1436	14.00%	423	3913	10.81%
7	260	1884	13.80%	46	316	14.56%	0	0	0.00%	68	481	14.14%	374	2681	13.95%
8	3	49	6.12%	1	2	50.00%	0	0	0.00%	1	12	8.33%	5	63	7.94%
9	207	1928	10.74%	168	1565	10.73%	174	1316	13.22%	139	1475	9.42%	688	6284	10.95%
10	917	7386	12.42%	892	6792	13.13%	913	7862	11.61%	689	6431	10.71%	3411	28471	11.98%
11	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
12	370	3038	12.18%	369	2527	14.60%	367	3136	11.70%	384	2859	13.43%	1490	11560	12.89%
13	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
14	0	2	0.00%	1	3	33.33%	2	26	7.69%	20	96	20.83%	23	127	18.11%
15	0	1	0.00%	0	0	0.00%	0	0	0.00%	5	28	17.86%	5	29	17.24%
16	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%	0	0	0.00%
17	61	4181	1.46%	53	3387	1.56%	1	1341	0.07%	88	5618	1.57%	203	14527	1.40%
18	16	639	2.50%	7	328	2.13%	0	97	0.00%	5	675	0.74%	28	1739	1.61%
19	249	1959	12.71%	165	1377	11.98%	0	1	0.00%	323	2150	15.02%	737	5487	13.43%
20	3	42	7.14%	0	0	0.00%	0	0	0.00%	125	797	15.68%	128	839	15.26%
21	1	10	10.00%	2	2	100.00%	0	0	0.00%	46	245	18.78%	49	257	19.07%
22	0	0	0.00%	0	0	0.00%	0	0	0.00%	15	67	22.39%	15	67	22.39%
23	0	5	0.00%	0	15	0.00%	0	23	0.00%	0	6	0.00%	0	49	0.00%
TOTALS	6929	88071	7.87%	7037	77121	9.12%	6978	78730	9.09%	6558	74603	8.79%	27502	318525	8.69%

IET ATTRITION BY TIME IN DEP FOR EDUCATION LEVELS

ALL YEARS (FY90-93)

	HS SENIORS			HS GRADS			NON-GRADS			PRIOR SERVICE			GED		
DEP	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss	Loss	Access	% Loss
1	33	379	8.71%	4869	47784	10.19%	61	403	15.14%	100	695	14.39%	235	1769	13.28%
2	95	1300	7.31%	4918	52213	9.42%	75	538	13.94%	68	4347	1.56%	339	2136	15.87%
3	277	3039	9.11%	3749	42265	8.87%	86	559	15.38%	30	2305	1.30%	156	1176	13.27%
4	376	4402	8.54%	2705	31333	8.63%	71	590	12.03%	28	1422	1.97%	105	909	11.55%
5	645	7639	8.44%	1896	21417	8.85%	66	480	13.75%	2	696	0.29%	77	519	14.84%
6	607	7818	7.76%	696	8725	7.98%	7	47	14.89%	2	349	0.57%	5	62	8.06%
7	610	7621	8.00%	353	4476	7.89%	7	38	18.42%	0	122	0.00%	3	26	11.54%
8	846	10560	8.01%	208	2740	7.59%	0	15	0.00%	0	76	0.00%	3	19	15.79%
9	704	8524	8.26%	102	1348	7.57%	3	15	20.00%	0	25	0.00%	2	10	20.00%
10	570	7437	7.66%	74	695	10.65%	1	20	5.00%	1	3	33.33%	2	6	33.33%
11	681	8088	8.42%	36	419	8.59%	3	23	13.04%	0	5	0.00%	2	7	28.57%
12	876	10193	8.59%	32	377	8.49%	4	45	8.89%	0	0	0.00%	0	11	0.00%
TOTALS	6320	77000	8.21%	19638	213792	9.19%	384	2773	13.85%	231	10045	2.30%	929	6650	13.97%

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